The Iron Age

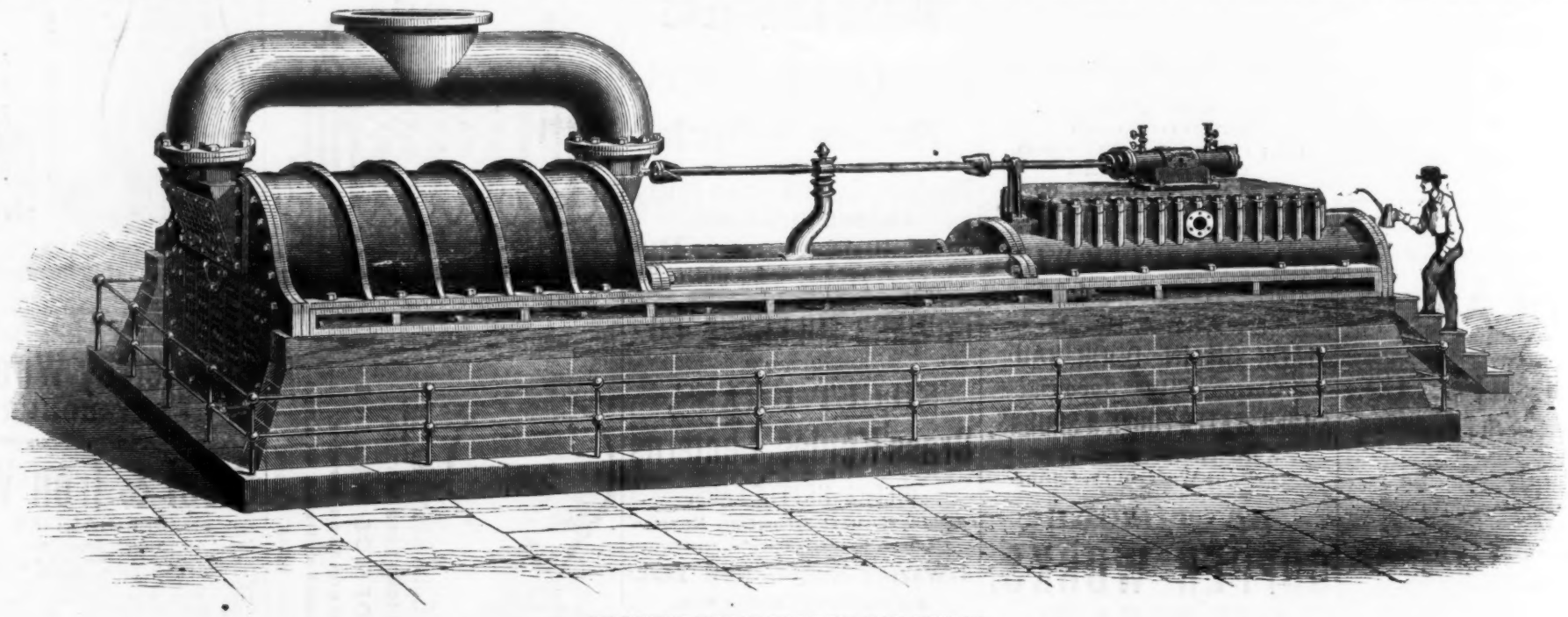
A Review of the Hardware and Metal Trades.

Published every Thursday Morning by DAVID WILLIAMS, No. 10 Warren Street, New York.

Vol. XVII: No. 6. *New York, Thursday, February 10, 1876.* *$4·50 a Year, Including Postage. Single Copies, Ten Cents.*

The Knowles Blowing Engine for Blast Furnaces.

We show in the accompanying illustration a horizontal blowing engine, resembling in many particulars the steam pumps so extensively used in all parts of the country. Both steam and blowing cylinders are horizontal and upon the same bed plate; a common piston rod connects the two pistons, and reduces the number of moving parts to a minimum. The bedplate in this form of construction becomes a simple distance piece to hold the two cylinders in their proper places, and the whole structure is supported upon plain foundation walls at a suitable distance from each other, and large enough to give the machine a bearing along its whole length. The moving parts consist of the piston rods and pistons, the usual air valves on the blowing cylinder and an ordinary D-valve for the steam cylinder. The latter valve is moved by a small steam cylinder placed upon the top of the steam chest. This valve, or auxilliary, cylinder has a projecting piston rod, which is also a valve stem. The partial rotation of this rod near each end of the stroke by a tappet arm on the main piston rod, causes the small piston to make a stroke, and thus moves



THE KNOWLES BLOWING ENGINE FOR BLAST FURNACES.

the valve of the large engine. It would hardly be possible to design a more simple machine for such a purpose. Ten or fifteen years ago there was a very great prejudice in favor of rotary pumps, that is, of pumps in which, beside steam and water cylinders, a fly-wheel was added to equalize the motion, giving it uniformity at the end of the stroke, and also enabling an ordinary eccentric driven valve motion to be used. The valve was used to effect a cut-off, and some little economy obtained by this means, considerably more than was attainable by engines using steam through the whole stroke. Gradually, however, it was found that the cheaper and less economical engines were practically just as reliable and durable as the rotative varieties, and now there are few, if any, firms making steam pumps which have not entirely abandoned the rotary patterns. And it is to be observed that the steam pumps are every year employed for heavier and more difficult work. They are used in not a few instances for water works engines, and with great success and satisfaction, it being found in almost every case—invariably, so far as we know—that the saving in cost of engine foundation building is so great that the interest account is decreased to a much larger extent than the coal bills are increased, thus producing a large net saving. The work of a blowing engine, so far as the application of the power is concerned, is not essentially different fron that of a pumping engine. The blowing engine is usually an air pump on a large scale, and therefore we may safely apply the experience of one case to the other. Among steam pump makers there has been a good deal of thought expended in the construction of air pumps of various kinds which have worked very well. The Knowles Steam Pump Works, 92 and 94 Liberty street, New York, whose blowing engine we illustrate, have built a great many blowing engines of various sizes and kinds—there are fourteen varieties on their catalogue—and have found the direct-acting principle to apply with as good results in pumping air as in pumping water. The work which they have done comprises most of the varieties where a blowing engine of any size or description could be used. This seems to show that we may safely change from the rotary to the direct-acting principle. But we have stronger proof than this, that many blowing engines of this kind have been at work in blast furnaces successfully. The machine which we illustrate is one of these. It is 10 feet stroke, 84 inch air cylinder and 37 inch steam cylinder. This machine performs satisfactorily, and has attracted some attention on account of its cheapness and simplicity. One of these machines costs from 50 to 75 per cent. less than an ordinary blowing engine, over which it has numerous points of advantage in the way of repairs and the like. This large saving of cost would more than balance a large coal bill, and in some cases we have found it was equal to nearly the whole coal bill. These engines can be worked as high or low pressure, and have a wide range of speed. An engine of this pattern, with 72 inch stroke and 72 inch air cylinder, can be run from one to 80 strokes per minute. The latter speed of course being exceptional, it shows very well the wide range which the machines have.

The Uses of Steel.

The following are the conclusions reached by J. Barba, naval constructor, Lorient, with regard to the adaptation of steel to various important uses in connection with shipbuilding and architecture:

Our observations have referred generally to only two varieties of mild steel, that manufactured at Terre-Noire and that of Creusot. These materials exhibited uniformity so complete in the various trials to which they were subjected, that it is evident that great regularity exists in the selection of the ores and the mode in which they are fabricated.

The plates and rolled bars coming from these works were generally of perfect homogeneity, and irregularities which often disquiet steel manufacturers were not noticed among them. The operation of rolling, to which the ingots are subjected, diminishes any small air holes that may have originally existed, by reducing them to short, almost imperceptible threads. It is hardly probable that the metal at their occurrence is welded under the hammer; but be that as it may, we have never noticed any failures from this cause.

It has been seen that the Martin steel from Creusot behaved like the less carbureted steel from Terre-Noire, having, apart from the amount of carbon, the same composition. The presence in the steel of other matters beside carbon evidently exercises a great influence on the properties of the metal, and may modify the simple laws that have been advanced, but their presence does not appear to affect the given data to any remarkable degree.

The precautions that have to be taken in working steel may be thus summed up: 1. To avoid all causes tending to produce local strains of any kind whatever. 2. If it is unavoidable to produce local strains from hammering, punching, &c., which may, as has been seen, conduce to rupture, to bring the piece to cherry red regularly and evenly, to let it cool in the open air, on an approximately homogeneous surface, forming, consequently, an equal heat conducting medium over its whole area.

This simple reheating—which may be regarded as annealing for the plates and profiled bars, on account of their slight thickness—restores the original qualities to the worked metal, even if it was in a condition of unstable equilibrium.

The precautions which our researches have shown to be necessary agree on most points with those recommended by Krupp, and which are quoted in the work by Mr. Reed, alluded to previously in these articles. Thus the advice he gives as to bending plates hot is as follows: "The plates ought to be heated before bending to a temperature not exceeding a bright cherry heat. It is necessary to heat as much as possible, and not merely the edges; indeed, when possible, the plate should be bent evenly throughout. By this means the effects caused by heating and cooling—effects greater in steel than in iron, on account of its greater density—are uniformly distributed. The thickest and strongest plates can be broken if only a portion of them is heated, bent and cooled. The bends which cannot be obtained in two consecutive heats ought to be given gradually and uniformly to the whole plate. In making a right-angled bend, for example, the whole plate must be bent first to 30°, then to 60° and then to 90°. After the completion of this operation the plate should be heated uniformly to a dull red. This annealing will restore equilibrium throughout the plate."

Although we do not entirely share these views, we have referred to it, because the precautions recommended in the preceding articles do not differ widely from the above recommendations which refer to more carbureted steel. It should be observed that a dull red heat is quite insufficient to anneal the metal; it improves but does not restore it to its original condition.

It has also been shown that a simple reheating with open air cooling, gives for plates and rolled bars an efficient annealing, practically as good as cooling in a close chamber. This is a matter of considerable importance, because it greatly simplifies one of the processes. The precautions shown to be necessary, and which are only those taken in iron boiler work, but carried further, cannot be always completed by fixed rules; but it will be found easy in almost every case to effect the desired object without much difficulty. According to the nature of the work, it is necessary to select certain classes of mild steel, in preference to others. Thus for all the parts of a structure which will have especially to resist shocks, it is advisable to employ a soft metal, which can sustain partial heats, repeated hammering, and will weld easily. On the other hand steel which has to withstand steady strains may be much harder and more resisting. At all events, we do not think it specially advantageous to employ, unless in very exceptional cases, steel less carbureted than that supplied by Creusot to Lorient. In replacing iron with steel differing but little from it in constitution, only a slight increase of strength is obtained with a great increase of cost. Mild steel having a resistance to rupture of about 30 tons to the square inch is easily worked, and from this class of metal the materials should be chosen for general construction purposes. More highly carbureted steel should be reserved for parts which require but little manipulation. Our observations have been confined only to thin plates and bars; in working greater thicknesses the difficulties encountered increase, simple heating with open air cooling being no longer considered sufficient for annealing; this operation should be completed in the furnace where the metal has been heated. But very slow cooling insures the crystallization of the interior, and thus has the inconvenience of removing the fibres obtained by forging. A satisfactory result can often be obtained by a regular tempering, but this may involve too great an alteration in elasticity, and may induce rupture. After tempering, the fibres in the center and on the surface are subjected to violent molecular tension, which absorbs a notable portion of their extension. Moreover, the tempered metal is from this single fact in a condition of elasticity more unfavorable than after annealing.

The steel is always obtained from the cast ingots; in this condition the metal does not possess those qualities which are afterward imparted under the hammer or in the rolling mill. Such pieces ought not to be heated suddenly, since the extension of the surface tends to internal rupture. Forged steel is less liable to rupture by sudden heating, since surface extension does not induce compression of the interior; it subjects it simply to tensile strain, which the manipulation of the steel under the hammer enables it to withstand. Nevertheless, it is judged more prudent to heat the large masses of wrought steel gradually, reducing to dull red the temperature of the furnace where they are placed when cold.

Similar precautions are necessary when a piece is subjected to a number of heats with slow cooling. It is known that by such a series of annealings the metal returns toward its original condition, losing a large part of its elastic properties. This effect has not been considered in the preceding articles, because in the cases dealt with the number of heats was limited. The slight thickness of the plates and rolled bars permitted them also to be placed in the gas furnace without previous reduction of temperature therein.

It is important that the steel delivered from the manufactories should be brought to the mildest condition possible consistent with their degree of carburization. With this object, rolling at too low a temperature should be avoided, and it is necessary to reheat the plates and bars before using them; this heat taking the place of annealing gives good results when brought to a cherry red. We do not believe that this temperature can be reduced, but careful experiments alone can decide the question, upon which some investigation has recently been made, especially with a view to ascertain the temperature necessary for annealing steel plates. Some Terre Noir test bars 2·36 in. wide were punched with holes ·67 in. in diameter. They were then heated in a gas furnace, the time employed in annealing being noted. On breaking them in the testing machine the following results were recorded:

TABLE No. XX.

Length of Heat.		Color of Test Bars in coming out of the Furnace.	Resistance to Rupture.
min.	sec.		tons per sq. in.
1	0	Black.	27·80
1	30	Very dull red.	29·30
2	0	Red.	31·52
2	30	Cherry red.	31·98
3	0	Clear cherry red.	32·83

Each of the above figures is the average of four tests. So far as they go the experiments prove that the original value of the metal can only be restored at red heat, and from red to cherry red there also appears a slight improvement.

To sum up: According to the experience recently acquired in the Port of Lorient, extensive works in mild steel can be undertaken without fear, and the metal can be used in place of iron. But a method analogous to that dwelt upon in the preceding articles must be followed as the only means of avoiding the difficulties so often met with in employing steel. The general use of a metal possessing a great strength and elasticity is of vast importance. And we shall consider ourselves fortunate, if, by the result and conclusions we have thus recorded, we have been able to contribute to this result, by removing the doubts of manufacturers and engineers who, knowing the extreme value of the material, have hitherto hesitated to employ it.

Memorable Mechanical Notes.

We clip the following from the *Engineering News*, of Chicago, Ill. The mechanical and scientific editor of that journal is evidently a genius, but we do not think that all the statements made in our extract are strictly true. They are none the less interesting, however, as evolutions from a very lively inner consciousness:

"Solid pistons turned an ⅛ of an inch larger than the cylinders, and forced into their places by hydraulic power, have been used with much success for high-speed engines. They are found to remain tight for a considerable time.

"The term 'twin-screws' originated in a nickname applied to Romulus and Remus on account of the meanness of their dispositions. This fact has, from a confusion of ideas, led many to suppose that the Roman war-galleys were fitted with the above mode of propulsion.

"The adhesion of locomotive driving-wheels may be increased by covering the tires with emery paper. The adhesion of the emery paper can be secured by gum.

"The best wood for railway sleepers is bird's-eye maple. In fact, no sleepers made of this wood have yet been worn out.

"The lead of a slide-valve is commonly made equal to the lap multiplied by one-tenth the travel. This proportion works well if it effects a good distribution of the steam.

"Paddle engines were first applied to the coracles of the ancient Britons.

"The durability of roofing slates may be much increased by creosoting them.

"All the machinery erected in the great pyramid in the time of the Pharaohs, for stuffing mummies, was driven by water-power.

"Concrete is gradually being substituted for iron as a material for steam boilers. One of its great advantages is that no safety valves are required, the concrete itself yielding when the pressure is too high.

"The first artesian well was sunk at Athens by Archimedes, to supply that city with water during a siege. The first Cornish pumping engine was also constructed by Archimedes.

"Corkscrews may be made of steel wire.

"Link motion was first applied to galley slaves by the ancient Greeks.

"When James Watt invented his regulator for steam engines, he gave it the name 'Governor,' out of his respect to his aged parent."

A special meeting of the English Channel Steamship Company confirmed the following resolution, which was passed at the general meeting, held on the 8th of December: That for the purpose of providing the necessary funds for building a "new steamship on Captain Dicey's twin-ship principle, or with such alterations and modifications, and at such price and on such terms and conditions as the directors of the company deem fit; and for the purpose of paying off the existing debenture debt and remaining liabilities of the company, as well as to make such alterations in the Castalia as may appear expedient to increase her speed; the original capital of the company be increased by a sum not exceeding £150,000 in shares of £10 each, bearing a preferential and cumulative dividend at the rate of 7 per cent. per annum, payable half yearly, and after payment of 7 per cent. per annum on the original capital of the company, the balance of income to be divided rateably over the original capital and the preference capital."

Metals.

ANSONIA

BRASS & COPPER CO.

19 and 21 Cliff Street,

(Adjoining Office of Phelps, Dodge & Co.)

Sheet Brass, Planished Brass, Polished Brass Door Rails, Brass Wire, Hayden's Patent Brass Kettles, Brass Tubing, Lamp Burners, Sun Burners,

Sheet Copper, Planished Copper, Copper Rivets & Burs, Braziers' & Bolt Copper, Braziers' Rivets, Copper Tubing, Copper Bottoms, Copper Wire, Iron Wire, Fence Wire.

A large variety of Wood and Bronze Case Clocks.

MANUFACTORIES AT ANSONIA, CONN.

Phelps, Dodge & Co.,

IMPORTERS OF

TIN PLATE,

Sheet Iron, Copper, Pig Tin, Wire, Zinc, etc.

MANUFACTURERS OF

COPPER and BRASS.

Cliff St., bet. John and Fulton,

NEW YORK.

A. A. THOMSON & CO.

Importers and Dealers in

Tin Plate, Sheet Iron,

ZINC, COPPER, WIRE,

Block Tin Spelter, Solder, &c.

Nos. 213 and 215 Water and 119 Beekman Sts.,

NEW YORK

P. O. Box 61.

T. B. CODDINGTON & CO.,

25 & 27 Cliff St., New York.

Importers of

TIN PLATES,

And **METALS** of all descriptions.

SCOVILL MFG. CO.,

419 & 421 Broome St., New York.

MANUFACTURERS OF

SHEET AND ROLL BRASS,
BRASS AND COPPER WIRE,
GERMAN SILVER, BRASS BUTT HINGES,
KEROSENE BURNERS.
METAL BLANKS CUT TO ORDER.
CLOTH AND METAL BUTTONS, in every variety.

PHOTOGRAPHIC GOODS.

MANUFACTORIES:

Waterbury, Conn.,
New Haven, Conn.,
New York City.

EVANS & ASKIN,

BIRMINGH M ENGLAND.

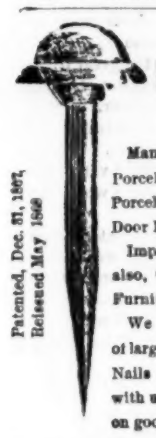
Refiners of Nickel and Cobalt.

SOLE AGENTS

VAN WART & McCOY,

134 & 136 Duane Street, N. Y.

Nickel and Cobalt always in stock.



Patented, Dec. 31, 1867. Released May 1868

THE RICHARDS Hardware Co.,

47 Murray Street, N. Y.,

Manufacturers of Richards' Patent Porcelain-head Picture Nails; also, Porcelain Picture, Drawer, Shutter, and Door Knobs, etc., etc.

Importers of German Brass Goods, also, China, Gilt, Steel, and Silvered Furniture Nails Wire Nails etc., etc.

We particularly invite the attention of large buyers to our Patent Picture Nails and Knobs being a specialty with us, we offer satisfactory discounts on good orders.

W. R. OSTRANDER,

Manufacturer of THE BEST IMPROVED

ALARM SPEAKING TUBE WHISTLE,

Speaking Tube, Elbows and Mouthpieces

Send for new Trade List.

SPEAKING TUBES FITTED UP.

19 Ann Street. NEW YORK.

SPEAKING TUBES,

Etc.

C. A. FREDERICKS

83 Fulton Street, New York.

PATENT ALARM WHISTLES.

Metals.

Waterbury Brass Co.

CAPITAL, - - $400,000.

JOHN SHERMAN, Agent,

No. 52 Beekman Street, NEW YORK.

Mills at WATERBURY, CONN.

Sheet, Rolled and Platers' Brass,

GERMAN SILVER,

Copper, Brass and German Silver Wire,

BRASS AND COPPER TUBING,

COPPER RIVETS & BURS,

BRASS KETTLES,

WASH BASINS,

Door Rail, Brass Tags & Step Plates.

PERCUSSION CAPS,

POWDER FLASKS,

Metallic Eylets,

Shot Pouches,

Tape Measures, etc.

Manhattan Brass Co.,

Manufacturers of

Sheet Brass, Brass Wire, Copper Wire, Copper Rivets, Brass Tubing, Spelter Tubing, Satchel Frames,

Olmsted Patent Oilers, Prior Patent Oilers, Broughton Patent Oilers, Brass, Tin & Zinc Oilers, Hurricane Lanterns, Baby Carriage Hardware, Stationers' Hardware,

BROWN'S PATENT PICTURE NAIL,

Pat. July 6th, 1875.

Agents for Hartford Eyelet Co.

Office, 83 Reade cor. Church Sts., N. Y.

Works, 1st. Ave. 27th to 28th Sts., N. Y.

J. H WHITE, President. H. L. COE, Secretary.
STEPHEN A. MIDDLEBROOK, Treasurer.

Holmes, Booth & Haydens,

49 Chambers Street, N. Y.

ESTABLISHED 1853.

CAPITAL, - - $400,000.

Manufacturers of all kinds of

Brass, Copper & German Silver,

ROLLED AND IN SHEETS.

BRASS & COPPER WIRE,

Tubing, Copper Rivets & Burs.

BRASS & IRON

JACK CHAIN, DOOR RAIL.

German Silver Spoons.

SILVER PLATED FORKS & SPOONS,

Kerosene Burners, &c.

Works at Waterbury, Conn.

BALTIMORE COPPER WORKS.

POPE, COLE & CO.,

Are now Purchasing

Copper Ores

and smelting and refining at these works, where, with experienced workmen and unusual facilities, we are turning out **Ingot** and **Cake Copper** of unequalled purity and toughness.

We are prepared to buy Ores, Matte, Regulus and other furnace material, in any quantities.

Office, 57 South Gay St., Works at Canton, Baltimore Md.

BALTIMORE AND LAKE COPPER Brazers Sheets & Tubes.

BUYS:

Old Copper, &c. Also Lead & Tin DROSS.

A. HARNICKELL, 22 Cliff Street, N. Y.

JOHN W. QUINCY,

98 William Street, New York.

NICKEL.

Pig Iron, Lead, Block Tin, and other Foundry Metals. Cut Nails.

Philadelphia Nickel Plating Works.

John Hartman,

37 1-2 North Seventh Street, Philadelphia.

Electro-Nickel Plating

Of all Metallic Articles finished in the best manner.

Fuller, Dana & Fitz,

METAL MERCHANTS.

Importers of Tin Plates, Pig Tin, Russia Sheet Iron, Swedish Iron, Etc.

110 North St., BOSTON.

E. A. Williams & Son,

BRASS & BELL FOUNDRY

No. 107 Plymouth Street,

et. Washington & Warren Sts., Jersey City, N. J.

Anti Friction Metals

Metals.

The Plume & Atwood Mfg. Company

MANUFACTURERS OF

SHEET and ROLL BRASS and WIRE,

German Silver and Gilding Metal,

Copper Rivets and Burs,

Kerosene Burners,

Shoe Eyelets, Lamp Trimmings, &c.

80 Chambers Street, New York.

13 Federal Street, Boston.

Rolling Mill, THOMASTON, Ct. | Factories, WATERBURY, Ct.

JOHN DAVOL & SONS,

Agents for

Brooklyn Brass and Copper Co.,

Dealers in

Ingot Copper, Spelter, Lead, Tin, Antimony, Solder & Old Metals.

100 John Street, N. Y.

W. J. HAMMOND,

Dealer in all kinds of

BRASS, COPPER,

Cast Iron, Wrought Iron,

AND STEEL SCRAP. *Cor. Eleventh St. and Duquesne Way, Pittsburgh, Pa.*

Bailey, Farrell & Co

BRASS FINISHERS and FOUNDERS.

Brass Work

FOR

Plumbers, Gas and Steam Fitters.

ENGINE BUILDERS.

Pittsburgh, - - Pa.

New Catalogue packed with first order or mailed on receipt of eight stamps.

EDWARD MILLER & CO.,

Manufacturers of

SHEET BRASS, Brass Kettles, Lanterns

OILERS, KETTLE EARS,

Spouts, Tinmens' Trimmings, Kerosene Lamps, Burners, Trimmings, &c.

4 Warren Street, New York.

Mill and Factories, Meriden, Conn.

The Wilmot Mfg. Co.,

98 John Street, Bridgeport, Conn.
50 Barclay Street, New York.

Manufacturers of

KEROSENE BURNERS AND LAMP TRIMMINGS, Etc.

We invite your attention to our extensive facilities for manufacturing articles of utility, novelty, or embellishment, and assure you of our ability to meet the requirements of every branch of trade. The increasing demand upon us has made it necessary to extend our works, and we now occupy the entire premises, No. 39 John Street, and our facilities for the production of Light Metallic Goods, in Copper, Brass or other Sheet Metals, are unsurpassed. The use of the most approved machinery and appliances, our long experience and established reputation in this branch of manufacture, encourage to solicit still more extended relations with those wa require work of this class, and we take this method of calling your attention to our establishment.

A. A. BENEDICT,

Manufacturers' Agent & Wholesale Dealer in

KEROSENE BURNERS, Lanterns, Lamps,

And Lamp Trimmings of all Descriptions,

Shades, Chimneys, Wicks, &c.

99 Chambers St., cor. Church, N. Y.

Agents for

ILLINOIS MFG. CO 'S LANTERNS.

Wire, etc.

ROEBLING'S WIRE ROPE

For Best

IRON or STEEL WIRE HOISTING, RUNNING or STANDING ROPES, or BEST GALVANIZED CHARCOAL WIRE ROPES FOR SHIP'S RIGGING,

Address, JNO. A. ROEBLING'S SONS, Manufacturers, Trenton, N. J. or 117 Liberty St., N. Y.

Wheels and Rope for transmitting power long distances. Send for Circul rs and Pamphlet.

Wire, etc.

PHILIP L. MOEN, Prest. & Treas. CHAS. F. WASHBURN, Sec'y.

WASHBURN & MOEN MANUFACTURING CO.,

Established 1831.

WORCESTER, MASS.

MANUFACTURERS OF

IRON AND STEEL WIRE.

WIRE RODS of all Grades; Round Iron, Rivet quality 3-16 in. to ½ in., cut to any length. Owners and exclusive Operators of the **PATENT CONTINUOUS ROLLING MILL,** producing Iron and Steel WIRE, in coils of 100 pounds without SEAM or WELD. **Patent Galvanized Telegraph Wire,** Market and Stone Wire, Annealed Fence and Grape Wire in long lengths; Coppered Pail-Bail Wire; Rope, Bridge, Bolt, Screw, Rivet, Buckle and Chain Wire. Wire for the manufacture of Card Clothing, Heddles, Reeds &c. Piano-string Covering Wire, Tinned Broom Wire and Tinned-plated Wire of all sizes. A specialty is made of Clock, Machinery, Gun Screw and Spiral Spring Wire, and Refined Wire to Pattern for particular purposes from selected stamps of Norway Iron. Any grade of Wire furnished, Annealed, Bright, Polished, Coppered Galvanized or Tin Plated. Wire furnished, Straightened and Cut to any length. **Steel Crinoline Wire.** Patent Linen finish. **Unrivalled Steel Music Wire.** Steel Wire for Springs, Needles and Drills. Market Steel Wire kept in stock, all sizes.

Warehouse, 42 CLIFF STREET, NEW YORK.

National Wire and Lantern Works.

Warehouse, 45 Fulton Street, New York.

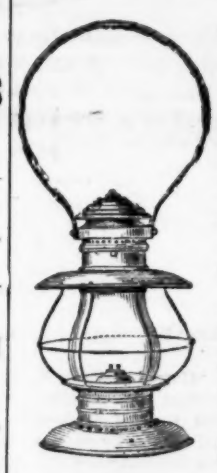
HOWARD & MORSE,

MANUFACTURERS OF

BRASS, COPPER AND IRON

WIRE CLOTH,

Ship and Railroad Lanterns,



Signal Lights, Conductors' Lanterns

ADJUSTABLE GLOBE HAND LANTERN,

DESK AND OFFICE RAILING

Riddles, Coal and Sand Screens,

NURSERY FENDERS & SPARK GUARDS

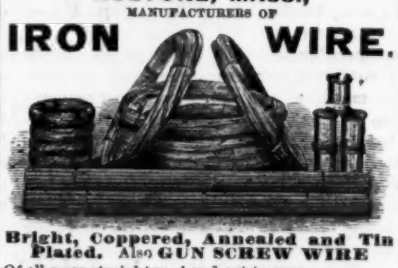
Ornamental Wire Fence.

Geo. W. Prentiss & Co.,

HOLYOKE, MASS.,

MANUFACTURERS OF

IRON WIRE.



Bright, Coppered, Annealed and Tin Plated. Also GUN SCREW WIRE

Of all sizes straightened and cut to order.

BRIDGEPORT BRASS CO.,

62 John Street, New York, Manufacturers of

Brass Door Rail, Cooper Rivets and Burs, Lightning Rod Cord Rings, Lamp Collars and Sockets, Sun Burner Shades, Kerosene Oil Burners, Corset Steels, Brass Hand Lamps, &c., &c.

Sun Burners, Brass Tubing, Brass and Copper Wire, Copper Bottoms, Iron and Tinned Rivets, Brass and Japanned Oilers, Tin Tobacco Boxes, Farmers' Lanterns.

ORDERS SOLICITED FOR SHEET BRASS.

Manufactories at Bridgeport, Conn.

The above cut represents our new **Marcy Lantern,** so that its advantages over others in market can readily be seen. With a tempered steel elliptic spring operating directly on the top, it can readily be adjusted and is firmly locked in its place. No sudden pressure on the guards or frame will displace the Globe; the Frame, Bail and Lock being all connected, there are no small parts to get lost or worn out. Arrangements complete for burning Kerosene, Candle and Oil.

New Jersey Wire Mill.

HENRY ROBERTS,

Manufacturer of

Steel & Iron Wire,

SPECIALTIES.

Tinned Wire, Tinned, Broom, Spring Wire, made from Bessemer Steel; Cast Steel and Iron Coppered Bail Wire; Rivet, Screw, Buckle, Umbrella, Fence Brush, Gun Screw Wire; Sewing Machine and Machinery Wire. Fine Wire for weaving. Also Wire of any shape made to order.

WIRE MILL, 39 Oliver St., Newark, N. J.

THE TRENTON IRON CO.,

Trenton, N. J.

JAMES HALL, Treas. CHAS. HEWITT, Prest.

IRON & WIRE.

Bar Iron. Wire Rods. Brazier Rods. Copperas.

Market Wire, Screw Wire, Fence Wire, Bridge Wire, Bail Wire, Square and Flat Wire, Cast Steel Wire.

Weaving Wire, Spring Wire, Telegraph Wire, Chain Wire, Buckle Wire, Tinned Wire, "Martin" Steel Wire

GUN SCREW IRON WIRE.

FENCE STAPLES.

Wire straightened and cut to lengths. Represented in New York by

COOPER, HEWITT & CO., 17 Burling Slip.

JASPER E. CORNING, WIRE GOODS.

Manufacturer of The Ready Barrel Head

ASH SIFTER.

58 Cliff Street, New York.

IRON AND STEEL WIRE ROPE

For Hoisting, Running & Standing Ropes, Ferries, &c.

CONSTANTLY KEPT ON HAND.

Address, HAZARD MFG. CO., Wilkesbarre, Luzerne Co., Pa.

ALBERT A. ARNOLD.

(Formerly SAMUEL PARKER & CO.)

Manufacturer of

BRASS, COPPER, STEEL & IRON

Wire Cloths

FOUNDRY RIDDLES, STEEL BROOMS & CASTING BRUSHES, Wire Flower Stands, Sponge Baskets, &c. Painted Wire Window Screen Cloth a Specialty.

Office and Manufactory, 161 Whalley Ave., New Haven, Conn.

New York Agency, PATTERSON BROS., Park Row, N. Y.

Brass Goods.

HICKCOX MFG. CO.,

280 Pearl St., N. Y., Manufacturers of

Stamped Brass & Silvered Goods.

PLATED ROSES, PICTURE NAILS,
" THIMBLES, DISKS,
" ESCUTCHEONS, BRASS CAPS,
DROP BASES, " LABLES.

Patent Mirror Business Cards,

The only *indestructible* and most attractive card, specially made for expositions, fairs, &c.

Patent Tin Handle Mucilage Caps & Brushes.

Special facilities for manufacturing small articles of new style and design to order.

Brass & Copper

SEAMLESS TUBING

For Locomotive, Marine and Stationary Boilers.

MERCHANT & CO.,

525 Arch & 590 Cherry Sts., Philadelphia.

HOOKS SMELTING CO.

SUCCESSORS TO

H. W. HOOK,
METALLURGIST,
SMELTER & BRASS FOUNDER,
MANUFACTURER OF
ALL KINDS OF
BRASS CASTINGS,
TYPE, STEREOTYPE,
BABBIT & ANTI-FRICTION
METALS.
ALSO IMPORTER OF
BLOCK TIN, LEAD,
ANTIMONY &c.
BROAD & HAMILTON STS. PHILA.

SUPPLIES.

JNO. D. SHEPARD
MANUFACTURER
BUFFALO N.Y.

THE

Gilbert & Bennett Mfg. Co.,

GEORGETOWN, CONN.,

MANUFACTURERS OF

Iron Wire, Curled Hair

AND GLUE.

Coal, Oat and Hair Sieves.
Hair & Wire Gravy Sieves.
Brass and Iron Riddles.
Brass and Iron Wire Cloth.
Cheese Safes.
Coal and Sand Screens.
Wire Ox Muzzles.
Stove Cover Lifters.
Coal Hods and Shovels.
Stove Scrapers and Pokers.

Gilbert's Rival Ash Sieve.

UNION METALLIC CLOTHES LINE

WIRE.

The highest price paid for Cattle's Tails and Hog's Hair

WAREHOUSE,

273 Pearl Street, New York.

NO MACHINERY, Cannot get out of Order.

ABSOLUTE PROTECTION, Simplicity of Action.

CLARK & CO.'S

PATENT

Self-Coiling, Revolving

STEEL SHUTTERS

FOR

Store Fronts & Rear Windows.

FIRE AND BURGLAR PROOF

Also, SELF-COILING

Wood Shutters

In various kinds of wood, suitable for Store Fronts, Private Houses, Offices, and School Partitions.

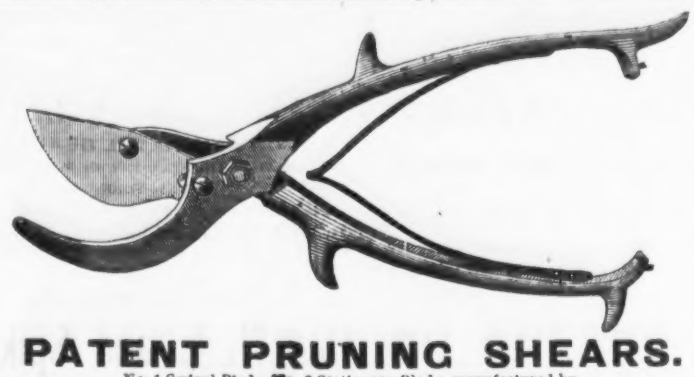
The Best & Cheapest Shutters in the World.

All Real Estate owners are invited to inspect them at the factory,

948 West 26th Street, New York.

JAS. G. WILSON, Manager.

Chicago Office, 54 La Salle Street.



PATENT PRUNING SHEARS.

No. 1 Swivel Blade, No. 2 Stationary Blade, manufactured by

TRENTON VISE AND TOOL WORKS,

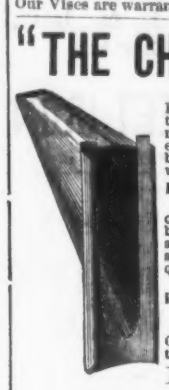
TRENTON, N. J., Manufacturers of

Solid Box Vises, Hammers, Sledges, Picks, Mattocks, Grub Hoes, etc.

Warehouse, 101 & 103 Duane St., N. Y., - - HERMANN BOKER & CO.

Our Vises are warranted to do more work than any other make. No broken boxes or screws.

"THE CHICAGO" TEA KETTLE.



We herewith illustrate the only really good TIN TEA KETTLE now made. We furnish only the Trimmings for them; and show cuts of the Handle and Spout. The former article is much stronger than any handle which has ever been introduced. It *fits the hand* splendidly, and being *hollow*, NEVER HEATS. The ear is strong and has a wide base. Altogether it is a fine thing, and sells at sight.

Price Plain, 75 cts. per doz.; Re-tinned, $1 00.

The Spout, it will be noticed, is stamped from one piece of I x Tin, and side flanges folded ready to lock into the body of the kettle; it is then double seamed to the bottom, as the rest of the body is. It never leaks, as do all other spouts, and cannot clog with lime. We have sold immense quantities of them, and the sale grows constantly.

Re-tinned, per doz.—5 in., (No. 50,) 67 cts.; 6 in., (No. 60,) 75 cts., 6½ in., (No. 70,) 80 cts.

All are 2¾ in. wide.

☞ If you make all of your Tea Kettles with the CHICAGO TRIMMINGS, you will materially increase your trade.

F. STURGES & CO.,

Proprietors of the

CHICAGO STAMPING WORKS,

Office and Salesrooms, - - 72, 74 and 76 LAKE STREET, CHICAGO, ILL.

P. R. ERLING & CO.,

122 West Water Street, MILWAUKEE, WIS.

Manufacturers' Agents and Jobbers of

HARDWARE, TIN WARE, RAILROAD SUPPLIES

And SPECIALTIES in the

IRON AND HOUSE-FURNISHING GOODS LINE. Open Feb. 1, 1876.

SILVER MEDAL.

AWARDED NOV 21, 1874.

This Compound is manufactured under the inventor's personal supervision, and is put up and warranted genuine only in 1, 5, 10, 50 and 100 lb. packages, and under the above trade mark. The 1, 5 and 10 lb. packages are kept for sale by the following, among other houses, who will also procure, on order, the larger ones:

C. VAN HORN & Co., New York City.
BOUTON & SMITH, " "
JOHN P. JUBE & Co., " "
GIFFORD & BEACH, " "
MAURICE E. VIELE, Albany, N. Y.
WINNE, BURDICK & Co., Troy, N. Y.
EVERSON, FRISSELLE & Co., Syracuse, N. Y.
S. B. ROBY & Co., Rochester, N. Y.
PRATT & Co., Buffalo, N. Y.
BARKER, DOUNCE, ROSE & Co., Elmira, N. Y.
HUGHES & HUTCHINSON, Trenton, N. J.
CONGDON, CARPENTER & Co., Providence, R. I.
F. A. & A. M. SMALL & Co., Boston, Mass.
BLODGETT & CLAPP, Hartford, Conn.
C. S. MERSICK & Co., New Haven, Conn.
FRED. A. TAFT, Bridgeport, Conn.
PARKHURST & WILKINSON, Chicago, Ills.
WYETH & BRO., Baltimore, Md.
SEWARD, NORRIS & Co., Baltimore, Md.
W. H. & G. W. ALLEN, Philadelphia, Pa.
GARRETT FINLEY & Co., Wilmington, Del.
A. BITTENBENDER & Co., Scranton, Pa.
WILCOX BROTHERS, Toledo, Ohio.
ROEHM & DAVISON, Detroit, Mich.
BOUTON, SMITH & WANDELL, St. Louis, Mo.
NICOLS & DEAN, St. Paul, Minn.
GEORGE FRITCH, Denver, Colorado.
JAMES MCGRAW, Richmond, Va.
W. W. WOODRUFF & Co, Knoxville, Tenn.
VANCE & KIRBY, Chattanooga, Tenn.
MIDDLETON BROS. & Co, Atlanta, Ga.
JOSEPH LABADIE, Galveston, Texas.
H. R. IVES &Co., Montreal, Prov. of Quebec.
JOHN G. WILKINSON & Co., Newburgh, N. Y

Any further information desired can be had by addressing

SCHIERLOH MANUFACTURING COMPANY,

24 Exchange Place, Jersey City, N. J.

O. LINDEMANN & CO.,

Manufacturers of

JAPANNED AND PATENT BRIGHT METAL

Bird Cages.

Received the

FIRST MEDAL

at the

World's Exposition of Vienna, 1873

Office and Salesroom,

No. 254 Pearl Street

Factory,

Nos. 252, 254 & 256 Pearl Street, NEW YORK.

BUCK BROTHERS, Millbury, Mass.

The most complete assortment in the U. S. of **Shank, Socket Firmer, and Socket Framing Chisels,**

PLANE IRONS.

Gouges of all lengths, and circles beveled inside or outside. Nail Sets, Scratch and Belt Awls, Chisel Handles of all kinds. Orders filled promptly; generally same day as received.

A Man of Honor.

In our report of the recent meeting of the National Association of Stove Manufacturers, we mentioned the honors paid to Mr. Giles F. Filley, President of the Excelsior Mfg. Company, of St. Louis, and promised to speak more fully of the circumstances which called out this unexpected but well deserved compliment. We now have the facts at hand, and take pleasure in giving them space in our columns.

Mr. Filley was born in Bloomfield, Conn., but went to St. Louis at the age of eighteen, in the employ of an older brother, who was engaged in the tinning business there. Like many an emigrant from New England, his honesty, industry and enterprise subsequently brought him liberal reward, and he became possessed of a large fortune. The story of the way he met a business disaster from over confidence in a business friend is thus told:

"Engaged in the mining business was a friend who had plenty of enterprise and but little money. Filley had unbounded confidence in him, and when the friend wanted an endorser for his notes Mr. Filley became his surety whenever requested, without keeping any record of the amount of money he was holden for. Eventually the mining friend failed, and these notes were presented to Mr. Filley for payment. Of course his surprise was great, but the fact gave him no anxiety, for he did not think the endorsements would amount to over $100,000, and he could pay that from his ample fortune. One hundred thousand dollars of notes were soon presented and promptly paid, but they did not stop coming until they amounted to $990,000. To pay this would make Mr. Filley a bankrupt. In fact, he had not the means to pay the entire claim, and he saw no way out of the dilemma at first but to go into bankruptcy, and this he decided to do. He had a business reputation second to that of no one in St. Louis, and, after mature deliberation, he decided that he would ask for a chance to pay his full indebtedness. He told his creditors that he could make more out of his property than if it were disposed of at auction, and he was given an opportunity to prove his assertion. He paid $500,000 down, and resumed business with renewed vigor and energy, and to-day the full amount—nearly $1,000,000—lost by over confidence in a friend, has been paid, with the exception of about $50,000, and Mr. Filley is abundantly able to pay that. The result shows what indomitable energy, pluck and perseverance can do when employed in the right direction."

These are substantially the facts of the case, but the few inaccuracies in the above statement are thus corrected by Mr. Filley in a letter to a friend in Boston, under date of January 1st, 1876, from which we are kindly permitted to make the following extracts:

I was very much gratified on receiving your letter of the 23d ult. While the statements in the papers are not strictly true, it is near enough for all practical purposes. I have paid now over a million of dollars. I still will have ——— more to pay. Of course, this has been a disagreeable job, particularly without any hope of a renumeration, except something may come from policies of insurance, which I carry on the life of ——— of over ——— This at present is no relief, but an expense, and will be until death overtakes the party. It is to be hoped that this, with all other irregularities that exists all over our country, will teach our American people a lesson by which they may profit. Were it not for the terrible shrinkage in values of all kinds of property, this job would not have been so burdensome. I have lost in what I called good assets, four years ago, over $300,000. But while I have done this I have maintained our credit and business, which has been extending all the time.

It is our business that I feel proud of. Of course, our profits are now small, and probably will be for years to come. I see but little hope for the future, and the only hope that I can see for us is in the quantity of work we do. Mr. Perry's estimate of the cost of producing stoves, as between a large and small quantity, seems to me settles the question as to the results of the stove business, particularly in the future. While the very large concerns may save themselves, the small ones, I think will be likely to show profits on the wrong side.

Yours, respectfully,
(Signed) G. F. FILLEY.

In view of the facts detailed above, the resolutions of respect and esteem adopted with enthusiasm by the stove manufacturers, will be seen to be something more than an idle compliment. Mr. Filley is in the enjoyment of a ripe and honored maturity—not yet an old man, nor broken in health or spirits by the great misfortunes resulting from the mistake which so nearly made a wreck of his life labor. Plain in tastes and habits, practical in all things, genial, kind and considerate to all, and modest to the point of sensitiveness, he naturally holds a high place in the affections of his brother manufacturers, and an honored position in St. Louis business circles.

Cheap English Iron Steamers.

The Philadelphia *North American* says: When, at the outset of our movement to establish iron shipbuilding on the Delaware, we contended that the mere cheapness of English iron steamers ought not to be considered a sufficient reason for purchasing them instead of patronizing our own shipbuilders, it was considered by some persons an extraordinary perversion of the true mercantile principle. We said at that time that our true course was to patronize our own mechanics and build better steamships. Still the devotees of mere cheapness insisted on the economy of buying low-priced English iron steamships, and we then maintained that there was no true economy in purchasing ships built of inferior iron, with less metal in the plates and less durability. Our declaration was at that time based on information derived from shipbuilders, and was then first made public. But while the friends of home industry credited the statement, the friends of the foreign interests disputed the truth of the comparison.

Nevertheless all succeeding experience has confirmed what we then claimed. A discussion two years ago in the British Institute of Architects elicited the fact that competition had driven builders and ship owners to the use of the cheapest iron in the market, and compelled them to depend upon insurance to cover the additional risk. Mr. Plimsoll's attacks have led to a full exposure of the dangers of this cheap iron, and it is not a matter of surprise that in the reaction that has occurred in England cheap iron steamers are so out of favor that they are sent to all other parts of the world to find sale or employment. Any required number of them can at any time be had for the American trade, and whenever a scheme is projected for an American line to some foreign port there is sure to turn up a lot of cheap and flimsy English iron steamers of all rigs for sale or charter.

But perhaps the most extraordinary statement on this subject is one just made by the London *Engineer*, a technical journal, to the effect that a worn-out iron ship built of a poor quality of iron is not worth breaking up, as the cost of breaking up and manufacturing the iron of the hull over again is more than the iron is worth; from which any business man may draw his own conclusions as to the actual quality of the iron used in these vessels. It is, in fact, the same sort of rubbish that was put into the cheap rails imported from England for American railways, and which were always breaking or wearing out and causing accidents and loss of life and property. This secret of cheapness explains the success of many classes of British manufactures, as is now notorious, English writers freely admitting that in cotton goods, hardware, and many other productions, American wares are more durable and substantial, and that the English cheapness is based on the use of inferior materials or a less quantity of them.

But even thus, the cost of an American iron ship, well built and of good materials, is but little above that of the English, while the ship itself is better. The advantage of the American shipbuilder lies in the superior tensile quality of our native iron, in the more extensive use of labor saving machinery, and in the fact that American workmen can and do perform more work in a given time than their English rivals. Lately the English shipbuilders have taken to building a better class of iron steamers to suit the changed tone of affairs, but, of course, they are no longer cheap, and all the arguments that so long gave them a monopoly of the trade are nugatory. How much of this change is reliable, and how much mere show, made for the purpose of getting business, remains to be tested. They can get good iron in abundance by importing it from America, or they can remove hither their shipbuilding establishments. Some idea of this kind induces *The Iron Age* to think that the reaction in favor of the best ships, rather than the cheapest, will make this Republic the great iron shipbuilder of the world. All that was requisite to render this practicable was that the English should admit the general inferiority of their own iron steamers, which has not only been very generally done, but has been put in an authentic form by Mr. Plimsoll's efforts, and by the discussion in the British Institute of Architects.

Unfortunately foreign capital is so largely embarked in the steamship lines and in the trades sustaining them that the influence in favor of the foreign steamers and against the American is very strong and difficult to contend with. It is complained that the rates are drawn by the foreign underwriters arbitrarily against American iron steamers, and that every technicality is availed of to give them trouble, as in the case of the steamers built at Chester for the Pacific Mail Steamship Line. This, however, is a matter that must be contended against patiently until those who thus embarrass the American interest shall find their efforts useless and unavailing to wear us out. Let us continue to build better iron steamers, put superior iron in them, and depend upon time and experience to do us justice, as we see at last being done to our cotton goods and hardware. In the meantime those who entertain any doubts on the subject may be referred to the English authorities we have mentioned, which ought to be sufficient to settle the question. English cheapness has generally become synonymous with some form of trade deception and adulteration.

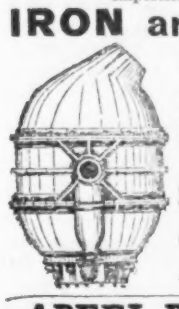
Improvements in Navigation.—It is well known that the German Naval Observatory, established at Hamburg by Von Freeden, has lately been purchased by the government, and become a national institution. Mr. Von Freeden has, during the seven years of his independent activity, collected 808 log books, embracing 4466 months of observations. There have been 385 log-books additional to these distributed to vessels, and may be expected to be returned within one or two years. An average of 71 steamers and 190 ships have corresponded with the office every year. The observations thus gathered from the ocean, he considers equivalent to the labors of 125 land stations. Wind and temperature charts of the North Atlantic have been published for the month of December, as illustrating the method adopted at Hamburg in working up the results of the observations. The principal labor of the institution is the investigation into the best paths for navigation, especially those appropriate to sailing vessels; basing calculations upon the labors of Maury, Andrau, Cornelissen and Toyubee, and upon Mr. Von Freeden's own investigations. He has lately begun to introduce his "suggestions as to the best paths on the ocean" into his instructions for the different seasons of the year, of which 113 vessels have availed themselves. In order to arrive at an approximate idea of the average accuracy of his sailing directions, he has endeavored to determine the average lengths of voyages by those following, and those not following his suggestions, and finds that on an average of about 600 voyages of the German vessels, those following his notices have gained six days over their companions on the ocean. In comparing these voyages, year by year, he finds a marked, steady increase in the shortening of the voyages of German vessels. From 1868 to 1870 the voyages were, on the average, 4½ days longer, but from 1872 to 1874, they were only 2¾ days longer than their predicted values.

Iron.

NEW YORK.

OGDEN & WALLACE,
Successors to GAM'L G. SMITH & CO.,
IRON WAREHOUSE,
85, 87, 89 and 91 Elm Street, New York.,
(One block below Canal Street.)
COMMON AND REFINED IRON
SHEET AND PLATE IRON,
Rod, Hoop, Band, Scroll, Horse Shoe,
Angle and T Iron.
PIG IRON, OLD RAILS,
Wrought Iron Beams. Iron of all sizes and shapes made to order.

PIERSON & CO.,
Iron Warehouse,
24 Broadway, 77 & 79 New St.,
NEW YORK CITY.
IRON and STEEL,
Common and Refined Iron Rods, Hoops, Bands, Scrolls, Horse Shoe, Ovals, &c., &c.
Swedes, Norway, Lowmoor & Bagnalls.
Orders filled from stock at lowest prices.

JACKSON & CHACE,
206 & 208 Franklin St., N. Y.,
Importers and Dealers in
IRON and STEEL.

Agents for
JOHN A. GRISWOLD & CO'S
Bessemer Steel.
MACHINERY STEEL,
Cast Steel and
SPRING STEEL,
ANGLE and T IRON.
Special Irons for Bridge and Architectural Work.

ABEEL BROTHERS,
Established 1765 by ABEEL & BYVANCK,
Iron Merchants,
190 South Street and 365 Water, N. Y.
ULSTER IRON
A full assortment of all sizes constantly on hand.
Refined Iron,
Horse-Shoe Iron,
Common Iron.
Band, Hoop and Scroll Iron.
Sheet Iron.
Norway Nail Rods.
Norway Shapes.
Cast, Spring and Tire Steel, etc.

A. R. WHITNEY. J. HENRY WHITNEY.
A. R. Whitney & Bro.,
Manufacturers of and Dealers in
IRON,
56, 58 & 60 Hudson,
48, 50 & 52 Thomas, and } NEW YORK.
12, 14 & 16 Worth Sts.,
Our specialty is in
Manufacturing Iron
Used in the Construction of
Fire-Proof Buildings, Bridges, &c.
AGENCY OF
Abbott Iron Co. Boiler Plate & Tank Iron.
Glasgow Tube Works Boiler Flues.
Penceyrd Iron Works Shafting.
Passaic Rolling Mill Angles and Tees.
A. R. Whitney & Bro.'s Rivets.
Whitney's Best Bar Iron.
Passaic Rolling Mill Wrought Iron Beams and Channel Iron.
Paxton Rolling Mills.
Books containing Cuts of all Iron now made, and Sample Pieces at office. Please address 58 Hudson Street.

METAL ROOFING.
Hickcox Mfg. Co.,
280 Pearl Street, N. Y.,
Manufacture the Patent Corrugated Iron Shingles, making the most durable Roof in the market, not affected by contraction or expansion, which causes soldered tin roofs to leak. Price only $6.50 per square, painted on both sides, packed ready for shipping.

BORDEN & LOVELL,
Commission Merchants
70 & 71 West St.,
Wm. Borden, } —— New York.
N. Lovell, }
Agents for the sale of
Fall River Iron Co.'s Nails, Bands, Hoops & Rods,
AND
Borden Mining Company's Cumberland Coals.

WILLIAM H. WALLACE & CO.,
IRON MERCHANTS
Cor. Albany & Washington Sts.,
NEW YORK CITY.
WM. H. WALLACE. WM. BIRPHAM

Iron.

NEW YORK.

C. HUERSTEL,
IRON AND STEEL.
Warehouse, 99 Market Slip, N. Y.
IRON AND STEEL OF ALL KINDS
Constantly on hand. Horse Shoe Iron and Nails, Norway Iron, Cast Spring, Toe Calk, and Bessemer Steel Tire.
Also, SPRINGS, AXLES AND BOLTS,
For Truck and Carriage Makers.

WM. GARDNER'S SONS,
SUCCESSORS TO WM. GARDNER,
575 Grand, 414 Madison & 309 Monroe Sts.
Bar, Hoop, Rod, Band and A. W. Horse Shoe Iron.
NORWAY NAIL RODS AND SHAPES.
Spring, Toe Calk, Tire & Sleigh Shoe Steel.
Manufacturers and Proprietors of
PATENT BOLT HEADER.

A. B. Warner & Son,
IRON MERCHANTS,
28 & 29 West and 52 Washington Sts.
BOILER PLATE,
Boiler Tubes, Angle, Tee & Girder Iron, Boiler and Tank Rivets.
Sole Agents for the celebrated
"Eureka," Pennocks,
"Wawasset," Lukens,
Brands of Iron. Also all descriptions of Plate, Sheet, and Gasometer Iron. Special attention to Locomotive Iron. Fire Box Iron a specialty.

Geo. A. Boynton,
BROKER IN IRON
70 WALL ST, N.Y.

POWERVILLE
ROLLING MILL,
JOHN LEONARD,
450 & 451 West Street, NEW YORK.
Manufacturer of Best Quality
HORSE SHOE IRON,
And HOOPS. Also Best Quality
Cold Blast Charcoal Scrap Blooms,
And Dealer in OLD IRON.

Marshall Lefferts, Jr.,
90 Beekman St., New York,
MANUFACTURER OF
AMERICAN
Galvanized Sheet Iron,
AND AGENT FOR THE
Easton Sheet Iron Works, Easton Pa.
MANUFACTURER OF
Best Bloom, Charcoal & Refined Sheet Iron.
Galvanized Telegraph and Fence Wire
Galvanized and Tinned Roofing and Slating Nails.
Galvanized Hoop Iron of all widths.
Galvanized Staples.
Corrugated Iron for Roofing, plain or gal'd.
Galvanized Bars and Chains for Cemetry Railing.
Tin Plates, Spelter, and other Metals.

DANIEL F. COONEY,
(Late of and Successor to Jas. H. Holdane & Co.)
88 Washington St., N. Y.
BOILER PLATES and SHEET IRON,
LAP WELDED BOILER FLUES.
Boiler Rivets, Angle & T Iron, Cut Nails & Spikes.
Agency for Pottstown Iron Co., Viaduct Iron Works, Lebanon Rolling Mills, Pine Iron Works, Laurel Iron Works, The Bergen Rolling Mills, at Jersey City.

J. C. LEFFERTS,
Metal Broker,
PIG, RAILROAD & SCRAP IRON.
241 PEARL STREET, NEW YORK.

Bonnell, Botsford & Co.,
Iron, Nails & Spikes.
YOUNGSTOWN, OHIO.

W. MINOR SMITH,
BROKER IN
Pig Iron & Metals.
95 BEAVER STREET, NEW YORK.

HOLDEN, HOPKINS & STOKES. IRON CAST STEEL, NAILS, RAILS, & R.R. SPIKES. 104-106 JOHN ST. NEW YORK.

Iron.

NEW YORK.

T. D. HAZARD,
BROKER IN
NEW & OLD RAILS,
Foreign and Domestic
PIG IRON,
Wrought and Cast Scrap Iron
AND GENERAL METALS.
204 Pearl St., New York.

JAMES WILLIAMSON & CO.,
SCOTCH AND AMERICAN
PIG IRON,
No. 69 Wall St., New York.

U. O. CRANE.
BROKER IN
PIG IRON & METALS,
104 John St. New York.

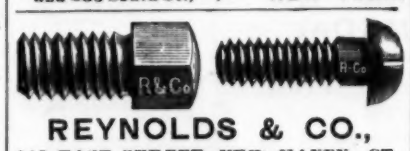
John W. Quincy,
98 William Street, New York.
Anthracite & Charcoal Pig Irons,
CUT NAILS, COPPER,
BLOCK TIN, LEAD, SPELTER, ANTIMONY, NICKEL, &c

BOONTON
CUT NAILS,
HOT PRESSED NUTS,
Machine Forged Bolts,
Washers.
Fuller, Lord & Co.,
BOONTON IRON WORKS,
139 Greenwich Street, New York.

Swedish Iron.
A Variety of Brands, including
UB HP NB 03
BARS suitable for Steel of all grades, Wire, Shovels, Hoes, Scythes, Carriage Bolts, Nail Rods, Tacks, &c.
CHARCOAL PIG IRON for Bessemer and Car Wheels.
MUCK BARS for Steel Smelting and Re-rolling.
SCRAP or BAR ENDS.
Direct Agency for N. M. HÖGLUND, of Stockholm, represented in the United States by
NILS MITANDER,
69 William St., New York.
ABBOTT & HOWARD, Boston, Mass. AGENTS: ALBERT POTTS, Philadelphia, Pa.

Dan'l W. Richards & Co.,
Importers of and Dealers in
SCRAP IRON,
Pig Iron,
OLD METALS.
88 to 104 Mangin Street,
Foot of Stanton St., E. R., NEW YORK.

B. F. JUDSON,
Importer of and Dealer in
SCOTCH AND AMERICAN
Pig Iron,
Wrought & Cast Scrap Iron,
English and American
HORSE SHOE IRON, &c.,
457 & 459 Water St., and 235 South St., } NEW YORK.



REYNOLDS & CO.,
145 EAST STREET, NEW HAVEN, CT.,
Manufacture
Iron and Steel Set Screws, Round, Square and Hexagon Head; Machine and Cap Screws; Piano, Knob and Lock Screws; Machine, Bridge and Roof Bolts, Bolt Ends, Blanks, Nuts, Washers, etc., of every description.
Send for Price List.

PETER P. PARROTT,
Manufacturer of the
"CLOVE"
ANTHRACITE PIG
IRON.
At Greenwood Iron Works,
ORANGE CO., N. Y.

Iron.

NEW YORK.

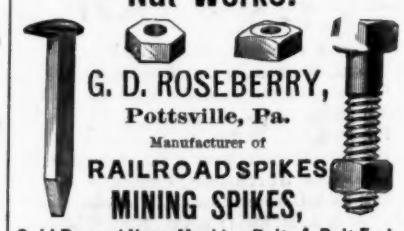
HARRISON & GILLOON
IRON AND METAL DEALERS,
558, 560, 562 WATER ST., and 302, 304, 306 CHERRY ST.,
NEW YORK,
have on hand, and offer for sale, the following:
Scotch and American Pig Iron, Wrought, Cast and Machinery Scrap Iron, Car-Wheels, Axles and Heavy Wrought Iron; also old Copper, Composition, Brass, Lead, Pewter, Zinc, &c.

OXFORD IRON CO.,
Cut Nails and Spikes,
R. R. Spikes, Splice Bars and Nuts and Bolts,
81, 83 & 85 Washington, near Rector St, N. Y.
JAMES S. SCRANTON, Agent.

BRADLEY, REIS & CO.,
NEW CASTLE, PA.,
Manufacturers of every description of
PLATE & SHEET IRON
Office, 29 Cliff Street, N. Y.

ESTABLISHED 1840.
PETER TIMMES' SON,
Manufacturer and Galvanizer of
Wrought, Ship, Boat, Dock & R. R.
SPIKES, RIVETS, NAILS, &c.
Nos. 281, 283 & 285 N. 6th St.,
Near junction of N. 3d St., Brooklyn, E. D.

BURDEN'S
HORSE SHOES.
"Burden Best"
Iron
Boiler Rivets.
Burden Iron Works, H. Burden & Sons
Troy, N. Y.

Pottsville Spike, Bolt and Nut Works.

G. D. ROSEBERRY,
Pottsville, Pa.
Manufacturer of
RAILROAD SPIKES
MINING SPIKES,
Cold Pressed Nuts, Machine Bolts & Bolt Ends.

ELY & CO.,
Hot Pressed Nuts, Bolts,
Bolt Ends, Rivets, Lag Screws,
Washers, etc. Hoop, Bar, Band and Horse-Shoe Iron.
113 Chambers Street, New York.

Spooner & Collins,
COMMISSION AGENTS,
PIG IRON
Blooms, Bar, Sheet & Hoop Iron.
409 N. Third St., (Room No. 6), St. Louis.

COLEMAN & BRO.,
Manufacturers' Agents and Brokers
PIG IRON, NAILS, RAILS, NUTS,
And General Railroad Supplies.
LOUISVILLE, KY.

J. O. CARPENTER,
Commission Merchant,
Common and Refined Bar and Nut Iron,
HOT PRESSED NUTS.
Machinery and Railroad Supplies, Carriage Machine Bolts and Washers.
(Room 14.) 104 JOHN STREET, N. Y.

Iron.

PITTSBURGH.

PENNSYLVANIA IRON WORKS.
EVERSON, MACRUM & CO.
Pittsburgh, Pa.,
Manufacturers of every description of
Bar, Sheet and Small Iron,
Make a specialty in
Fine and Common Sheet Iron.

W. P. TOWNSEND & CO.,
Manufacturers of
WIRE and
Black and Tinned Rivets
OF CHOICEST CHARCOAL IRON.
Rivets any diameter up to 7-16inch and ANY LENGTH required.
19 & 21 Market St., PITTSBURGH PA.

A. G. HATRY,
Manufacturers' Agent and Broker.
Bar, Sheet, Tank, Boiler, Angle, T, and Railroad Iron,
Nails & Spikes, Steel & R R. Supplies.
PITTSBURGH, PA.

SHOENBERGER & CO.
Manufacturers of
CUT NAILS,
AND
Spikes,
HORSE AND MULE
SHOES,
Horse Shoe Bar, &
SHEET IRON.
Goods warranted equal to any in the Market. Send for Circulars in regard to "PICKED NAILS."
PITTSBURGH, PA.

Boston Rolling Mills
Manufacture extra quality small Rods, from best selected Scrap Iron.
SWEDISH AND NORWAY SHAPES, Nail and Wire Rods. Also,
HORSE SHOE IRON and HAND MADE HORSE SHOES.
BOSTON ROLLING MILLS, W. R. ELLIS, Treas.
Office, 17 Batterymarch St., Boston.
Messrs. N. S. Arnold & Co., 312 California St., San Francisco. Sole Agents for the Pacific Coast.

"PEMBROKE"
Round, Square & Flat Iron.
"FRANCONIA" Shafting & Bar Iron.
Extra quality when great strain or superior finish is required. Also, Irons for ordinary work, like the
"ENGLISH REFINED."
WM. E. COFFIN & CO.,
No. 8 Oliver Street, Boston.

ASA SNYDER,
Importer of Scotch, and Furnace Agent for the celebrated Antnracite and Hot and Cold Blast Charcoal
PIG IRONS.
OFFICE AND YARD:
1008, 1010, 1012 and 1014 Cary Street, Richmond, Va.
Orders for Scrap Iron filled.

P. W. GALLAUDET.
Banker and Note Broker,
Nos. 3 and 5 Wall Street,
NEW YORK.
HARDWARE, METAL, IRON, RUBBER, SHOE, PAPER AND PAPER-HANGINGS, LUMBER, COAL AND RAILROAD PAPER WANTED.
ADVANCES MADE ON BUSINESS PAPER AND OTHER SECURITIES.

J. P. WALSH,
Celebrated XX Mineral Facings
P. O. Box. 4536.
121 Chambers Street. NEW YORK.

CUTLER & BROWN,
Shippers and Dealers in all grades of
MOLDING SAND,
FIRE SAND, FIRE CLAY & KAOLIN.
Also, manufacturers and dealers in
FOUNDRY FACINGS and SUPPLIES.
Office, 288 Cherry Street, N. Y.
Sand Banks at Albany; Retail Yard, 454 Cherry Street; Factory, 273 & 275 Cherry Street.
GEORGE W. CUTLER CLARENCE J. BROWN.

IRON RAILINGS.
D. Vreeland,
Plain and Ornamental Iron Works Railings, Doors, Shutters, Gratings, Stoop Gates, Window Guards, and Builders' Iron Work in general.
138 W. 38th St., near Broadway, New York.

Phoenix Brass & Iron Foundry
EDWARD GOUGH, Allentown, Pa., Manufacturer of
Soft & Hard Chill Rolls, Sand Rolls & Pinions.
Hard Chill Rolls are guaranteed to be uniform and made to any depth of chill, to suit.
The only manufacturers of Soft Chill Rolls in the United States.

Iron.

PHILADELPHIA.

Iron and Steel T and Street Rails

Of Best American and English Makes.

CHAIRS, SPIKES, FISH BARS, RAILROAD SUPPLIES.

Muck Bars, OLD RAILS, Scrap, BLOOMS.

American and Scotch

PIG IRON, AND METALS.

CHAS. W. MATTHEWS,

133 Walnut St., Phila.

[Late RALSTON & MATTHEWS, 133 Walnut St.]

MALIN BROS.,

IRON

Commission Merchants,

No. 228 Dock Street,

3d door below Walnut, PHILADELPHIA.

H. L. GREGG & CO.,

Ship Brokers & Commission Merchants,

Importers of

Old Iron, Metals and Rags.

Freight engagements made to all parts of the world. Marine insurance effected in reliable offices.

108 Walnut St., Phila.

JUSTICE COX, Jr. & CO.,

Iron Commission Merchants.

Foundry and Forge Pig Iron, New and Old Rails, Muck Bar, Scrap, &c.

No. 333 Walnut Street, PHILADELPHIA.

THE CAMBRIA IRON WORKS,

Situated on the line of the Pennsylvania Rail Road, at the western base of the Alleghany Mountains, are the largest of their class in the United States, and are now prepared to make

1800 TONS PER WEEK,

Of Iron and Steel Railway Bars.

The Company possesses inexhaustible mines of Coal and Ore, of suitable varieties for the production of Iron and Steel Rails of

BEST QUALITY.

Their location, coupled with every known improvement in machinery and process of manufacture enable them to offer Rails, when quality is considered, at lowest market rates.

The long experience of the present Managers, of the Company, and the enviable reputation they have established for "CAMBRIA RAILS," are deemed a sufficient guarantee that purchasers can, at all times depend upon receiving rails unsurpassed for strength and wear by any others of American or foreign make. Any of the usual patterns of rails can be supplied on short notice, and new paterns of desirable weight or design will be made to order. Address,

CAMBRIA IRON COMPANY,

218 S. 4th St., PHILADELPHIA.

or at the works, JOHNSTOWN, PA.

The Phœnix Iron Co.,

410 Walnut St., Philadelphia.

MANUFACTURERS OF

CURVED, STRAIGHT AND HIPPED

Wrought Iron Roof Trusses

BEAMS, GIRDERS, AND JOISTS,

and all kinds of Iron Framing used in the construction of Iron Proof Buildings.

Deck Beams, Channel, Angle and T Bars

curved to template, largely used in the construction of Iron Vessels.

Pat. Wrought Iron Columns, Weldless Eye Bars,

for Top and Bottom Chords of Bridges.

Railroad Iron, Street Rails, Rail Joints and Wrought Iron Chairs.

Refined Bar, Shafting, and every variety of Shape Iron made to order.

Plans and Specifications furnished. Address

SAMUEL J. REEVES Vice Pres.

The LACKAWANNA IRON & COAL CO.,

SCRANTON, PA.,

(OFFICE IN NEW YORK CITY, 52 WALL STREET,)

MANUFACTURERS OF

BESSEMER STEEL RAILS,

RAILROAD IRON,

Forge and Foundry Pig,

BEST DOUBLE-REFINED MERCHANT BAR IRON,

CAR AXLES AND STRAP RAIL.

ORDERS CAN BE FILLED AT ONCE.

Iron.

Warren Spike Works.

G. W. FAHRION,

Manufacturer of

Railroad, Ship and Boat

SPIKES,

All Shapes and Sizes, Black and Galvanized.

Warren, Ohio.

J. & J. Rogers Iron Co.,

AUSABLE FORKS,

Essex Co., - - - N. Y.

Manufacturers of

FINE CHARCOAL

Blooms & Bars

For Conversion into Cast Steel.

ALSO,

Horse Shoe, Round Square and

FLAT IRON,

Exclusively from Palmer Ore.

Agents:

Merrit Trimble, - - - 21 Platt St., N. Y.
John Moorhead, - - - Pittsburgh, Pa.

Wrought Iron Buildings, Wrought Iron Bridges, Corrugated Iron Roofs, Shutters, Doors, Flooring, &c. Corrugated Sheets of all sizes manufactured by Moseley Iron Bridge and Roof Co., No. 5 Dey St., N. Y.

Siemens' Regenerative GAS FURNACE.

RICHMOND & POTTS,

119 S. Fourth St., PHILADELPHIA, PA.

OLD DOMINION

Iron and Nail Works Co.,

RICHMOND, VA.

R. E. BLANKENSHIP, Commercial Agent,

Manufacture

NAILS AND BAR IRON.

Bands, Scrolls, Horse Shoe Bars, Nut and Rivet Iron, Spike Rods, Shafting, Bridge Bolts, Ovals, Half Ovals, Half Rounds, &c.

HOLSKE MACHINE CO.,

279 Cherry St., near Jefferson St.

ELEVATORS

For Hotels & Stores a specialty.

Machinery in General made to order.

W. D. WOOD & CO.'S

PATENT

Planished Sheet Iron.

Patented March 14th, 1865; April 8th, 1873; Sept. 9th, 1873; Oct. 6th, 1874.

Guaranteed fully equal in all respects to the

IMPORTED RUSSIA IRON,

and at a much less price.

FOR SALE,

by all the principal

METAL DEALERS

In the Large cities throughout

THE UNITED STATES.

And at their Office,

111 Water Street, PITTSBURGH, PA.

New Patents.

We take from the records of the Patent Office at Washington the following specifications of certain patents, lately issued, which will be found interesting:

IMPROVEMENT IN BOTTOM PLATES FOR PUDDLING FURNACES.

Specification forming part of Letters Patent No. 170,529, dated November 30, 1875, issued to Samuel Dallar, of Parkesburg, Pa.

The object of this invention is to construct for puddling furnaces a bottom, simple in its construction, and admitting of being readily replaced, in whole or in part, when injured, and of being extended or contracted, as circumstances may require.

On reference to the drawing, Figure 1 is a plan view, partly in section, of the improved bottom plate; Fig. 2, a longitudinal section.

The bottom plate is composed of a series of sections, D, each consisting of a flat hollow cast metal chest, closed at the outer edges, and rabbeted at those edges which are in contact with the edges of the adjoining sections, so that, when a number of sections are placed in their relative positions, they will form a flat shallow box containing a chamber, B, as shown in the drawing. Each section is cast with a series of strengthening connections, *c c*, extending from the bottom to the top, and openings are formed at suitable points in the edges, to permit the entrance and exit of water, steam, or air to and from the chamber B.

Fig. 1.

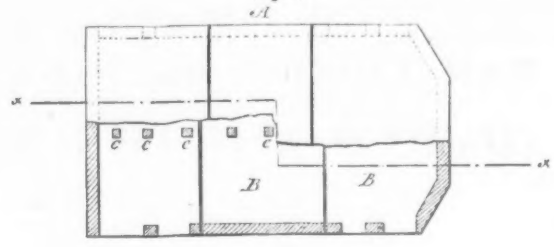
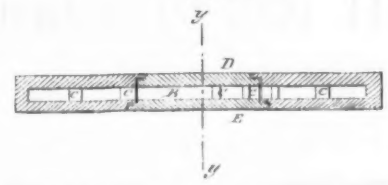


Fig. 2.



IMPROVED BOTTOM PLATES FOR PUDDLING FURNACES.

The bed plate is secured in the usual position in the furnace, and is covered by the ordinary lining, a current of water, air, or steam being passed through the chamber B, and the bed plate being thereby maintained at such a temperature as will neutralize the deteriorating influence of the heat on the metal.

By casting the bed plate in sections, its manufacture is facilitated, its cost, compared with the usual hollow beds, is reduced, one or more sections can be removed and replaced without discarding the entire bed, the size may be varied by simply increasing or reducing the number of sections.

The connections or pillars *c c* not only prevent the top of the bed from sagging when heated, but they also brace and impart rigidity to the entire structure, so that it will support, without bending, the heavy weight placed upon it.

Claim.—A bed plate consisting of a group of hollow sections, D, closed at the outer edges, excepting where air, water, or steam is admitted and discharged, and rabbeted at the joints, as set forth.

IMPROVEMENT IN PUDDLING FURNACE DOORS.

Specification forming part of Letters Patent No. 170,225, dated Nov. 23, 1875, issued to Joseph Royland, of Troy, N. Y.

This invention consists of one or more ribs or flanges on the door, in combination with one or more swing stops on the door frame contrived to fasten the door effectually, whether it closes entirely or only partially, and so that the puddler can operate the fasteners with the least possible loss of time and interference with the performance of his work.

Figure 1 is a front elevation of a furnace door with the improved fastening, and Fig. 2 is a horizontal section of the wall of the furnace above the door when it is closed.

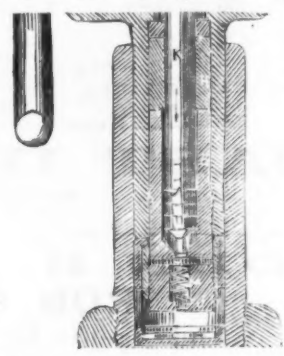
A represents the swing stops on the door frame or furnace wall, and B the curved ribs on the door with which the stops act to fasten the door shut. The ribs are a little eccentric to the pivots of the stops, so that in case any matters get under the door so as to prevent it from closing down tight, the stops will fasten it all the same, although they are not permitted to swing down the ribs all the way. The dotted lines show the positions of the stops when they are thrown up to free the door for opening it, in which positions they are held by pins D, so that they can be thrown down in the most ready manner, and without delaying the puddler materially in his legitimate work.

Claim.—The combination of one or more swing stops A, on the furnace wall or door frame, with one or more curved ribs or flanges, B, on the door, substantially as specified.

We take the following abstract of new patents, issued Dec. 7, from the official record:

HYDRAULIC JACK.—REISSUED.

To E. M. Dudgeon, San Francisco, Cal.—Within a hollow ram is the pump barrel. The plunger is hollow, and passes the water through itself to and from the reservoir. The lower end of it is constructed to extend through the lower valve seat and open the valve, to return the water to the reservoir, and is bored out



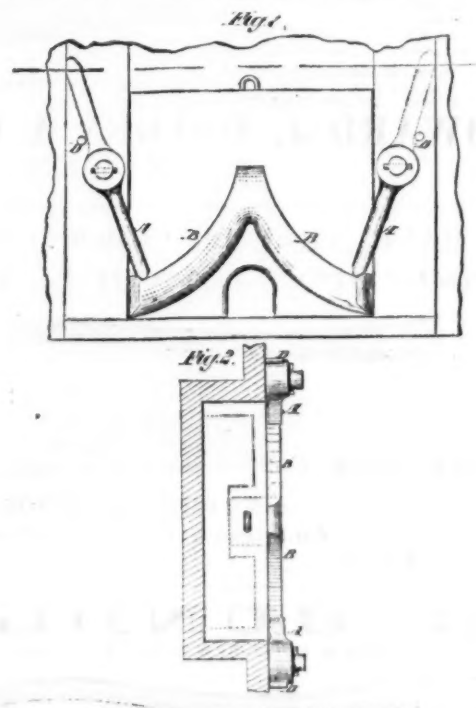
that the water pressure in forcing may close the plunger valve.

1. The combination, with the reciprocating ram, tube, or shell, C, working in cylinder A, of a tubular pump plunger contained therein, whereby the operating fluid is passed through said plunger.

2. The combination, with the hollow-pump plunger K and pump barrel E within the ram, packed as aforesaid, of the valves L M, and the apertures or passages *i l n*.

3. The hollow pump plunger K, made to extend through the bottom of the pump barrel, in combination with the lower valve M.

4. The valve box J, having a central cavity with parallel sides to hold and guide the spring valve *m*, and cut out or chambered at its upper end to form the water space between said cavity and the pump barrel.



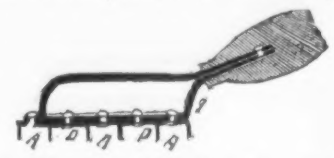
IMPROVED PUDDLING FURNACE DOOR.

CURRY COMB.

To C. A. Hotchkiss, Bridgeport, Conn.—The handle of the back of the comb is made in two pieces, one of which forms a brace for the comb, being firmly riveted to the comb. The back of the comb is made solid by means of filling strip placed between the tooth bars, and riveted to the end pieces and handle.

1. Filling plates D, combined with comb bars A.

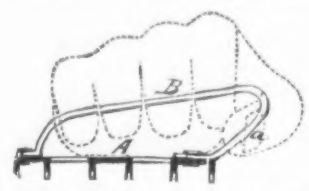
2. The handle to the back of a curry comb formed of two pieces, C G, of which the piece



C extends across the back of the comb to brace and strengthen the same, and is bent upward to form the thumb rest *g*.

CURRY COMB.

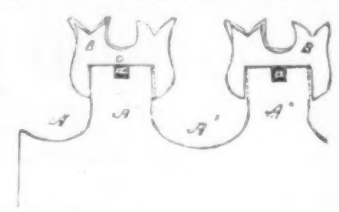
To C. A. Hotchkiss, Bridgeport, Conn.—The handle B, attached at both ends to the curry



comb frame, said handle being bent, as shown, to extend beyond the side of the frame, forming an obtuse angle with the frame, and also an inclined thumb rest *a*.

CROSS-CUT SAW.

To J. E. Emerson, Beaver Falls, Pa.—1.—A cross-cut saw composed of the blade A, having the projecting bases A' and spaces A'' between them, and the removable plate B, having a series of cutting points or teeth *b*.

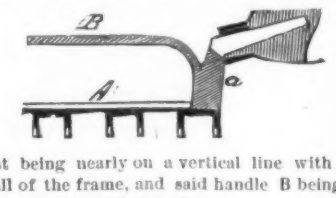


2. A cross-cut saw constructed to have the teeth thereof attachable and removable.

3. The attachable and removable plate B, having two or more cutting points or teeth, *b*, thereon, and forming a part of a cross-cut saw.

CURRY COMB.

To C. A. Hotchkiss, Brideport, Conn.—A curry comb having frame A, handle B, thumb rest *a*, and tang C formed of one piece, said thumb

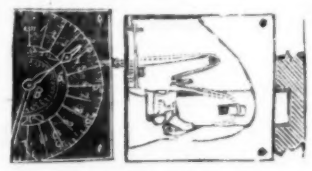


rest being nearly on a vertical line with the wall of the frame, and said handle B being on the same line with tang C.

TIME LOCK.—REISSUED.

To Stephen W. Hollen, Cincinnati, O.—A lever connection extends from the case of a time lock over into the case of a non-chronometric lock, and governs the action of a dog, which dogs the bolt of the non-chronometric lock.

1. The combination of a time mechanism and a non-chronometer lock with a lever connection operated by the time movement, said



lever being constructed and located to hold a bar or dog for dogging the bolt of said lock and rendering it incapable of being unlocked, when locked, until the arrival of the appointed time, when the time mechanism ceases its dogging action and admits of the bolt being operated.

2. The combination of a time mechanism and a non-chronometric lock, each arranged in its own casing, with a lever connection operated by and extending from the time movement and from or through its casing into the casing of the non-chronometer lock, for operating means for preventing the bolt of said lock being unlocked, when locked, until a certain predeterminate time.

3. In combination with a non-chronometer lock, a time mechanism having a lever connection operated by the time mechanism for dogging the bolt of the non-chronometer lock, with a mechanism for operating the lever to release the bolt for unlocking, and with a mechanism for automatically stopping the running action of the time mechanism when the bolt is so released.

The *Frankfurter Zeitung* mentions that whereas before the war Berlin had only 200 French artisans, it has now 240. They are mostly stucco workers, carpenters, tapisseurs and designers, and are in request for their taste and punctuality. Prince von Pless employs French workmen exclusively, 60 in number, in the erection of his new Renaissance mansion, the architect being M. Detailleur, of Paris, who is now being consulted as to the fittings and furniture. A large portion of the aristocracy send their orders to Paris, being better and more cheaply supplied than in Berlin. Prince Putbus has even had building articles from the neighborhood of Paris sent to the Island of Ruegen, the cost with freight being less than that of home material. The French workmen, 100 of whom are cooks, earn from 9f. to 20f. a day, and are very thrifty. They muster every Saturday night at a particular cafe.

Iron.

CLEVELAND.

CLEVELAND ROLLING MILL CO.,

MANUFACTURERS OF

BESSEMER STEEL RAILS,

Plates and Forgings, Railroad Iron, Merchant Bar, Beams, Girders, Splices, Bolts, Spikes, &c., &c.

Office, Nos. 99 and 101 Water St., CLEVELAND, O.

A. B. STONE, Pres. H. CHISHOLM, V. P. & Gen. Supt.
E. S. PAGE, Sec'y.

Cleveland, Brown & Co.

IMPORTERS, MANUFACTURER AND DEALERS IN

IRON AND STEEL,

HORSE SHOES, HORSE NAILS,

NORWAY NAIL RODS,

NAILS, SPIKES,

"Standard Taper" Axles & Swedes Iron,

WINDOW GLASS,

Wrought Iron Pipe and Boiler Tubes.

Chains, Rivets, Nuts, Washers, and Heavy Hardware Generally.

25 27, 29 & 31 Merwin Street,

CLEVELAND, OHIO.

The Iron-Masters' Laboratory.

Exclusively for the Analysis of Ores of Iron, Pig and Manufactured Iron, Steels, Limestone, Clays, Slags & Coal for Practical Metallurgical Purposes.

No. 339 Walnut Street, Philadelphia.

J. BLODGET BRITTON.

This Laboratory was established in 1866, at the instance of a number of practical Iron-masters, expressly to afford prompt and reliable information upon the chemical composition of the substances above mentioned, for smelting and refining purposes. The object being to make it at once a convenient, practically useful, and comparatively inexpensive adjunct to the Furnace, Forge and Rolling Mill.

CHARGES TO IRON WORKS.

For determining the per cent. of Pure Iron in an ordinary Ore	$4 00
For the per cent. of Pure Iron, Sulphur and Phosphorus in do	12 50
For each additional constituent of usual occurrence	1 50
For those of unusual occurrence or difficult to determine, the charge must necessarily depend upon circumstances.	
For determining the per cent. of Sulphur and Phosphorus in Iron or Steel	14 00
For each additional constituent of usual occurrence	6 00
For the per cent. of Carbonate of Lime, and Insoluble Silicious Matter in a Limestone	10 00
For each additional constituent	2 00
For the per cent. of Water, Volatile Combustible Matter, fixed Carbon, and Ash in Coal	12 50

For determining the constituents of a Clay, Slag, Coke, or of an Ash of Coal the charges will correspond with those for the constituents of an ore.

For a written opinion or letter of instruction the charge must necessarily depend upon circumstances.

Printed instructions for obtaining proper average samples for analysis furnished upon application.

WALLACE & HUMPHREY,

Analytical Chemists,

113 Walnut St., PHILADELPHIA.

Special attention given to analysis of Iron and Steel.

EDWARD HART,

Analytical Chemist,

LAFAYETTE COLLEGE, EASTON, PA.

Edward J. Hall, Jr.

BLAST FURNACE ENGINEER.

452 Franklin St., BUFFALO, N. Y.

Lord's Boiler Cleansing COMPOUND,

For Removing Scale in Steam Boilers! For Preventing the Formation of Scale in Boilers! For Neutralizing Mine and Sulphur Waters!

GEORGE W. LORD, 232 Arch St., Phila.

GRATE BAR

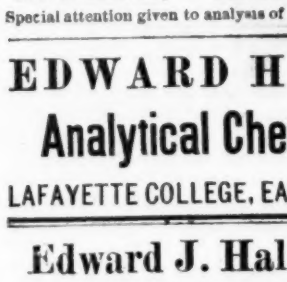
"ECONOMY."

GEO. VANDERBILT, Sole Agent.

Especially adapted for burning Pea Coal, Pea and Dust, and other fine material.

Office, Foot West 19th Street, New York.

Watchman's Improved Time Detectors.



U. S. Patent, April 24, 1873.

This is the latest and most complete Instrument invented, with 12 keys for 12 stations. Send for circular to IMHAUSER & CO., 212 Broadway, N. Y. P. O. Box 4788.

N. B.—We will protect our customers against all claims of other Patentees.

Iron.

THE MILWAUKEE IRON CO.

Manufactures and Offers For Sale

MERCHANT BAR IRON.

Flat Bars up to 6x2. Rounds and Squares up to 4 inch, Ovals, Half Ovals, Half Rounds, Box Iron Cylinder Bars, Plow Beam Iron, &c. Also, Hoop, Band, Horse Shoe and Shafting Iron of superior quality. A full assortment in store after February 1st.

PIG IRON.

Superior No. 1 Foundry Iron constantly on hand. Bessemer Iron and Special Grades of Foundry Iron made on orders.

RAILROAD IRON.

Thirty Patterns, from 30 to 65 lbs. per yard. Re-rolling done on short notice.

RAILROAD SPLICES.

Fish Plates to fit all rails used in the West. Track Bolts made from Iron of superior quality. A large stock on hand. New patterns made promptly.

CAR LINKS AND PINS.

All patterns kept in store or made to order. Link and Pin Iron in stock.

CAPACITY OF WORKS FOR 1876.

Merchant Bar Iron	20,000 tons.
Pig Iron	35,000 "
Railroad Iron	40,000 "
Railroad Splices and Couplings	5,000 "

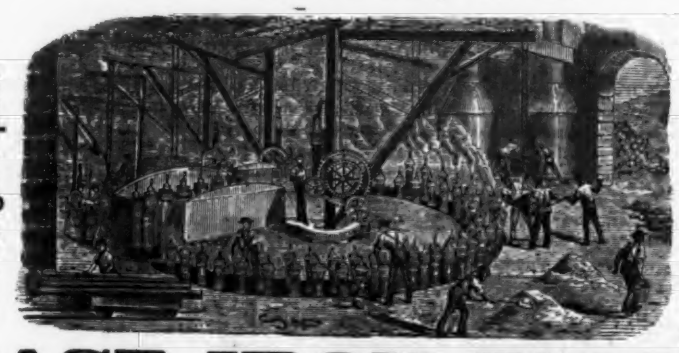
Address all correspondence to

MILWAUKEE IRON CO., Milwaukee, Wis.

JOHN McNEAL & SONS,

BURLINGTON, N. J.

Flange Pipes.



General Foundry Work.

CAST IRON PIPES

FOR WATER AND GAS.

JOHN H. REED & CO.,

IRON MERCHANTS,

And Agents for BAY STATE IRON CO.,

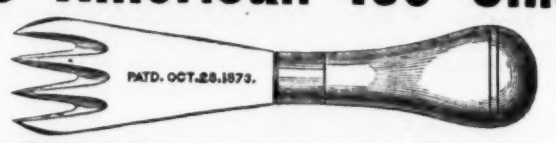
Manufacturers of and Dealers in

Homogeneous Boiler & Fire Box Plates, Plate, Sheet, Pig & Railroad Iron. Wrought Iron Girder, Channel & Deck Beams.

ANGLE and T IRON, BOILER and TANK RIVETS, Lap-Welded Iron Boiler Tubes, Wrought Iron Steam and Gas Pipe.

OFFICES, - - - 2 Pemberton Square, Boston, Mass.

The American Ice Chisel



Is superseding all others. It will save your time, save your ice, save your refrigerator, save your money. It shaves more rapidly than a Crusher, and splits as true as a saw. The blade is of the best English Steel, carefully tempered. Address orders to,

EDWARD J. HOLDEN & CO.,

P. O. Box 2167, Or No. 54 Beekman Street, NEW YORK.

JOHN CRANE, Agent, 103 Chambers St., N. Y.

GREENSBORO' HANDLE WORKS.

Manufacturers of SPOKES and CARRIAGE WOOD WORK, AXE, PICK, German and American SLEDGE and other Handles.

Send for Catalogue and Price List.

V. G. HUNDLEY.

79 Reade Street, New York. Agent for

North Carolina Handle Co.,

(WILSON & SHOBER, Proprietors.)

Manufacturers of *SPOKES, AXE, PICK, SLEDGE, HAMMER, HATCHET, and other Handles.* Full assortment always on hand.

Iron.

WHEELS AND AXLES MADE OF THE BEST STOCK AND IN THE MOST careful MANNER. FURNISHED SEPARATELY OR "FITTED" MAKING COMPLETE SETS.
TAYLOR IRON WORKS ON THE LINE OF THE CENTRAL R.R. OF NEW JERSEY
HIGH BRIDGE, N.J.
CAR WHEELS & AXLES
DRAW HOOKS AND FORGINGS.
LEWIS H. TAYLOR PRES'T
S. P. RABER, SUP'T
JAS. H. WALKER SEC'T & TREAS.
NEW YORK OFFICE 93 LIBERTY ST.
STEEL TIRED WHEELS MADE UNDER SAX & KEAR'S PATENT FOR LOCO TRUCK AND TENDER AND PASS'R CAR SERVICE

ATKINS BROTHERS,

PROPRIETORS OF THE

Pottsville Rolling Mills & Pioneer Furnaces

POTTSVILLE, PENNSYLVANIA.

Having introduced New and Improved Machinery into their Rolling Mills, and manufacturing all their Iron from the ore, and also doing all Machine Work and Repairs in their own shops, they are enabled to produce

RAILROAD IRON

Of uniform quality, unsurpassed for strength and wear, and of any required length.

Address the Proprietors Pottsville, Pa.

IRON FOUNDRY.

ESTABLISHED IN 1840.

SAMUEL J. CRESWELL, Jr.,

OFFICE: 812 Race St. WORKS: Twenty-Third & Cherry Sts.,

PHILADELPHIA.

Iron Fronts, Stairs Girders, Lintels, Columns etc

VERMONT SNATH CO.;

Springfield, Vermont.

Manufacturers of all kinds of

Scythe Snaths, Grain Cradles, Machinery Castings.

R. M. GREEN & CO., Agents, 100 Chambers St., N. Y.

JAMES C. HAND & CO.,

Commission Merchants,

PHILADELPHIA.

AGENTS FOR THE SALE OF

PIG IRON, Wm. Penn, Norristown and Reading Furnaces.
WM. JESSOP & SONS' Cast Steel, &c., &c.
READING NAIL AND IRON CO.'S (Crescent Brand) Nails, Brads and Spikes.
BARROW, SAVERY & CO.'S Tinned, Enameled and Plain Hollow Ware, Medium and Carron Hollow Ware, Sad, Tailors' and Laundry Irons, Fire Dogs, Wagon Boxes, Savery's Patent Combined Enameled Water Cooler and Refrigerator, &c., &c.
PENNSYLVANIA CORUNDUM CO.'S Corundum in Casks and Packages.
WASHINGTON MILLS EMERY CO.'S Best Turkish Emery in Casks and Packages.
FISHER & NORRIS' Patent American Anvils and Vises.

The Britannia Ironworks Company, Limited,

Middlesbro' England,

MANUFACTURERS OF

ALL DESCRIPTIONS OF IRON RAILS.

Surplus Stocks of Various Sections always on hand.

London Office: W. G. FOSSICK, 6 Laurence Pountney Hill, E. C.

Weekly Output, One Thousand Tons.

BAEDER, ADAMSON & CO.,

Manufacturers of

Sand and Emery Paper and Emery Cloth

(Also, in Rolls for machine work.)

GROUND EMERY, CORUNDUM AND FLINT,

Glue & Curled Hair, Cow Hide Whips.

STORES:

PHILADELPHIA, 730 Market St., | BOSTON, 143 Milk St.,
NEW YORK 67 Beekman St., | CINCINNATI, 92 Main St.,
CHICAGO, 182 Lake St.

BIRMINGHAM SCREW CO., Limited.

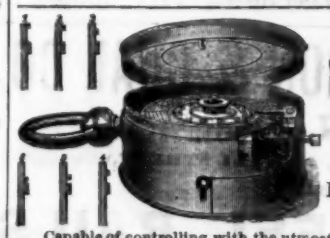
ALFRED FIELD, President.

The Screws of this company are imported only in small, limited quantities.

ALFRED FIELD & CO.,

Sole Importers,

93 Chambers and 75 Reade Streets, N. Y.



BUERK'S Watchman's Time DETECTOR.

Important for all Large Corporations and Manufacturing Concerns.

Capable of controlling with the utmost accuracy the motion of a watchman or patrolman as the same reaches different stations of his beat. The instrument is complete in itself, portable and as reliable as the best lever watch. It requires no fixture or wires communicating from room to room, as is the case with the ordinary watch clocks. A small inexpensive stationary key is alone required at each station. The instrument will, in all cases, be warranted perfect and satisfactory.

CAUTION.—The public are notified that in my suit against Imhæuser & Co., of New York, a decree was made in my favor, June 10, 1874.

Proceedings have been commenced against said Imhæuser & Co., for selling clocks contrary to the order of the Court, and especially the clock with a series of springs in the cover, and marked "Patented Oct. 20th, 1874." All persons discovered using these infringing clocks will be dealt with according to law.

J. E. BUERK, Proprietor,

P. O. Box 979. No. 230 Washington Street, Boston.

☞ In sending for circular or ordering the above, please mention this paper.

W. & B. DOUGLAS,

MIDDLETOWN, CONN.

The Oldest and Most Extensive Manufacturers of

PUMPS,

HYDRAULIC RAMS,

GARDEN ENGINES

AND OTHER

Hydraulic Machines

IN THE

WORLD.

Awarded the GRAND MEDAL of PROGRESS at WORLDS' EXPOSITION, VIENNA, 1873, being the highest awards on Pumps, &c., also, highest medal at PARIS in 1867.

Descriptive Catalogues and Price Lists sent when requested.

BRANCH WAREHOUSES,

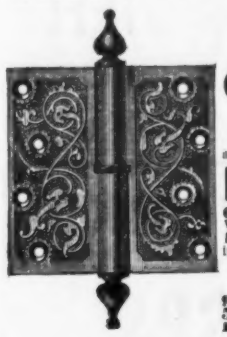
85 & 87 John Street, N. Y.

AND

197 Lake St., CHICAGO, Ill.

UNION MANUFACTURING COMPANY,

Manufacturers of all styles Plain and Ornamental Butts



LOOSE PIN REVERSIBLE,

Cast Fast & Loose,

Drilled and Wire Jointed.

Japanned, Figured Enameled, Nickel Plated, and Real Bronze Butts. Also a full line of

IRON & BRASS PUMPS,

Cistern, Well, and Force Pumps, Yard, Drive Well, Garden Engine and Steam Boiler Pumps, Hydraulic Rams, etc., and all with the most modern improvements. ☞ Fine Castings a Specialty.

NEW BRITAIN, CONN.

Warehouses,

99 Chambers St., N. Y. 4 India St., Boston, (Butts.)
52 Washington Square, Boston. (Pumps.)
Heaton & Denckla, 397 Commerce St., Phila., (Butts.)
Send for Illustrated Catalogue and Price List.

IRON CORN SHELLER

Is acknowledged by all who have used it to be the **Best Hand Corn Sheller Made.** These facts are attested by over 20,000 Farmers who have bought and used them.

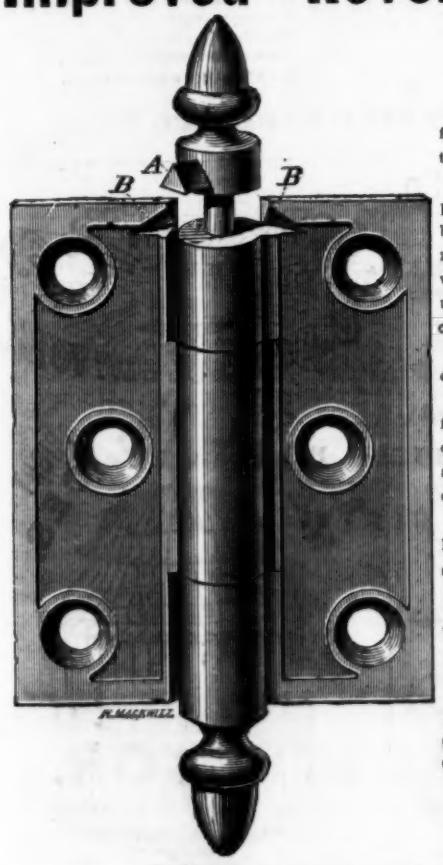
For Terms and Prices, address,

Rumsey & Co.,

SENECA FALLS, N. Y.

Improved Reversible Butts.

PATENTED.



This Butt avoids all of the objectionable features of the Common Reversibles, and offers the following improvements:

1. **It prevents the possibility of the pin raising in use.** This is accomplished by a three sided plug (A), which, when the hinge is closed, fits into the notches (B B). As the working up of the pin is necessarily very gradual, it is pressed back each time the door is closed.

2. Driving out the pin when desired is easily done by merely tapping under the plug at A.

3. It is impossible for the door to be opened from the outside by removing the pins, as this cannot be done when the Butt is closed. This is a valuable feature in the case of doors opening on porches or halls.

These goods are sold on the same list and as low as the old style Reversible, and are fast superseding them.

Sample by mail when requested.

Western Butt Co.,

Sole Manufacturers,

Semple, Birge & Co.,

Sole Agents,

SAINT LOUIS, MO.

RHODE ISLAND HORSE SHOE CO.,

OFFICE, 81 Canal Street, Providence, R. I. WORKS at Valley Falls, R. I.

Manufacturers of

PERKINS and RHODE ISLAND PATTERNS of

HORSE AND MULE SHOES.

Short Historical Sketch of Zinc.

From the records of the Chinese, we learn that they were acquainted with metallic zinc at a very early period. The metal was imported from India by the Portuguese in the seventeenth century, under the name of spianter, or spialter, before its nature was recognized in Europe. Whether the ancient civilized nations of the West were acquainted with metallic zinc cannot be ascertained, but there is a great probability that they were. The high degree of development of some of the ancient nations on the shores of the Mediterranean, with regard to metallurgical operations, their very extensive manufacture and use of brass, make it most likely that they knew also metallic zinc, and some way of extracting it from its ores. It is true that the writings of the old Greek and Roman authors do not refer to it; they regarded brass and yellow metal as only a colored copper, and the Greek word "chalkos," as well as the Latin word "aer," meant both copper and brass, though some authors, as Strabo and others, used sometimes the word "aurichalcum" for the latter. This, however, only related to the color, and meant nothing but a gold-like copper. If we consider the difficulty of communication, the continual and violent political revolutions in the ancient world, the absence of all the present facilities for spreading and preserving any knowledge—further, the fact that our historical sources consist chiefly of the fragmentary writings of a few philosophical scholars, we may easily conceive the possibility that some ancient knowledge may have been entirely lost to us. Our oldest historical documents, the writings of Aristotle (fourth century B. C.) and Dioskorides (third century B. C.), refer to the manufacture of brass, by admixing an earthy substance ("kadmea") with the copper. The latter author also mentions the application of zinciferous deposits from the brass kilns for the same purpose, and distinguishes from it the white oxide or flowers of zinc, under the special name of "pompholix." In his description of the latter substance he compared its appearance to that of wool, which gave rise to the newer alchymical name of "lana philosophica," much used by the authors of the middle ages.

As, in general, the principles of the Alexandrian scholars, and especially those of Dioskorides, were forming the foundation of natural science for a long period, so it was also the case with regard to their views on brass, and the other zinciferous substances. The following Roman authors—Pliny, sen. (first century A. D.), Strabo (first century A. D.), and Festus (fourth century A. D.) who left us some treatises on natural history—adhered to those principles, and throughout the whole middle ages, down to the latest time, we find them prevailing; the only thing worthy of remark for our purpose during that period is the origin of some words relating to zinc.

From the fifth century A. D., we find the name "jutia" employed instead of "kadmea" or "cadmia," as well for calamine as for the zinciferous furnace deposits. Zosimus in the fifth, Geber in the eighth, and Avicenna in the eleventh century, make use of it in their treatises on brass smelting. Some Arabian authors, also, employed the word "clymia," or "calimia," synonymously with "jutia," from which words subsequently calamine or "lapis calaminaris" was derived. The latter word appears first in the writings of Albertus Magnus, in the thirteenth century. He made a distinction between "calaminaris" and "jutia," applying the former word to the natural mineral, and the latter to the zinciferous furnace deposits, and considers them both equally applicable to brass making. The word "zinc" or "zinken" is of later origin. We find it employed, first, in the fifteenth century by Basilius Valentinus, without, however, any clear definition accompanying it, which even leaves it uncertain whether he meant a metal by it or some other zinciferous substance. The first who described metallic zinc by that name, and undoubtedly in accordance with some of its real properties, was Paracelsius (sixteenth century), although it would appear that his notion did not generally prevail, for down to the end of the seventeenth century a general confusion existed about the use of the word. Some authors employed it for the zinciferous furnace deposits, some for bismuth, cobalt and other metals. It was only at the commencement of the eighteenth century that the ideas on the nature of brass and zinc became clearer. Kunkel announced in the year 1700, and Stahl conclusively in 1718, that calamine required to be reduced to zinc before it would combine with copper during the brass smelting process. The notion prevailed, however, for some years afterward that a reduction of calamine into metal was only practical when copper was present, until Schwab in 1742, and Markgraf in 1746, published some methods of zinc distillation by means of fire standing retorts.

From this time we meet also with credible records of practical enterprises for carrying out the distillation of zinc on a large scale. For many centuries three districts in Europe were chiefly noted for producing zinc ores—some parts of the South of England, the neighborhood of Aix-la-Chapelle, near the Rhine, and the environs of Beuthen, in Upper Silesia. It is certain that the calamine mines of Altenberg, near Aix la-Chapelle, have been worked from about the year 1430. In 1565 the first concession was granted for starting a calamine mine, near Beuthen in Silesia, where many mines were soon after opened, of which the Scharleygrube was, and is still, the richest. At all these places the ore formed an important article of trade, and was sent (especially from Aix and Beuthen) to the various distant brass works. It is obvious that from these places the first efforts proceeded for extracting metallic zinc on a large scale, and in England, Dr. Isaac Lawson seems to have been the first who succeeded in introducing a practical method for that purpose; in the year 1758, a patent was granted in the name of Champion for a method of extracting zinc from blende, called at that time "black jack," "mock jack," or "bragill." The first works were erected in the neighborhood of Bristol, and were described by Watson, who visited them in 1766. According to his reports, their method was very similar to that in use in England to so recent a period as twenty years ago; it was a "distillatio per descensum," and forms the basis of the old English system for reducing zinc. In this process the distillation took place in closed crucibles; the volatilized zinc was made to pass through an orifice at the bottom of the crucibles into a vertical iron tube, where the vapors of the metal were condensed, and dropped into a vessel containing water standing beneath it. The furnaces used were either rectangular or round, with a fire place in the middle, surrounded by the crucibles. This method was the only successful one employed throughout Europe for even about 50 years, and it attained considerable development, so that it competed for even 20 or 30 years longer with the newer methods, which are generally adopted under the name of the Belgian and Silesian systems, and which are more open to modifications and improvements. Both these systems originated about the beginning of the present century, when almost contemporaneously (in the years 1808 and 1809) patents were taken out by the Abbot Donny, at Liege, and J. Chevalier Ruberg, at Wessola, in Silesia, for new methods of reducing zinc.

The principal difference between the three methods mentioned lies in the form of the clay vessels or retorts introduced for the reduction and distillation of the metal. In the English process that vessel consisted of a large crucible, in the Belgian it represents a cylinder, and in the Silesian process a somewhat oblong, flat sided tube, termed muffle. It is hardly necessary to say that this difference in the shape of the retorts arose originally from the way which the inventors found to succeed best in their first trials to extract the metal. Ruberg, for instance, performed his first experiments by means of a common assaying muffle, as used for cupellation. These muffles are generally of a semi-circular front, and so we find them also employed for the zinc smelting process in Silesia to about the year 1835, only of larger size. The peculiar shape of the retorts influenced the arrangement of the furnaces of the different systems. Of the Belgian tubular retorts several horizontal rows could be placed in one furnace, forming an arched chamber with a fire place beneath, while the flat bottomed muffles only allowed of the arrangement of a single horizontal row along both sides of a fire place, covered over by a flat arched vault. By such a disposition it was practicable, both in the Belgian method as well as in the Silesian method, to fix the condensing apparatus entirely outside the furnace, convenient to the workman, and facilitating as much as possible the operations of charging and discharging the retorts. This is one of the great advantages which the two newer systems exhibit in comparison with the older one. Another is in the practicability of enlarging the furnaces, the original size of which was small. Even the first improvements were not as much directed toward the enlargement of the furnaces as toward that of the retorts. In the first place, the necessary temperature for the reduction of the zinc ores, and especially the great advantage of a swift process, were underestimated. Most of the Silesian zinc works, to the year 1835, employed muffles of 18 in. width inside, which of course only required to be charged once every two or three days, without even then allowing of a complete exhaustion of their charges. Similar anomalies we meet with also in the Belgian system. The size of the retorts forms, no doubt, one of the most important elements in the zinc smelting process, and the development of our two present methods is chiefly due to the recognition of this fact.

It has been mentioned already that in the second half of the last century the first zinc works were commenced in England; so also the discovery of the two methods in Belgium and Silesia was soon followed by the erection of zinc works in those countries. The first one in Belgium was that of St. Leonard, at Liege, and in Silesia, the Lydogniahuette, at Koenigshuette, both starting about the years 1809 and 1810.

However, the practical application of metallic zinc was still at that time a very limited one. Zinc was regarded as a brittle metal, not suitable to be worked by itself, and though Hobson and Sylvester, at Sheffield, proved by some experiments, in the year 1805, its ductility and fitness for being rolled into sheets, the only application of it was to the manufacture of brass and yellow metal; but even for this purpose the use of calamine was kept up for some time. No wonder that the demand for spelter, and, consequently, the activity of the smelting works, were very limited. At intervals, under the influence of speculation, the price of the metal advanced sometimes to a considerable extent, but only to decline afterward. No metal has undergone in modern days such extremes in price as spelter; frequently we find it varying on the Continent from $50 to $375 per ton within the last fifty years, and it is obvious that such a state of things could not be favorable to the development of the spelter trade in general.

Step by step, however, this unsteadiness ceased with the rapidly spreading recognition of its almost unparalleled advantages for many technical purposes. Great progress was made in this direction by the successful application of the metal to artistic and monumental castings, applied first at the Royal Iron Foundry, at Berlin, in the year 1833. Even in the earliest times bronze was proved to be the metallic substance most suitable for such castings, and it will, no doubt, continue so for the classic monumental art. The costliness of bronze, however, limits considerably the common use of it in the ornamental line, and the want of a more generally applicable substitute led long ago to many experiments with cheaper metal, as, for instance, cast iron, and even lead. The difficulties connected with the casting of large iron statues, and with the chiseling of them afterward, are great points against the use of this metal, whilst its exceeding softness, ponderosity, and consequent instability, render the latter almost unfit for the purpose. Zinc, on the other hand, offers, by its natural properties, and its comparatively low price, every qualification for it. The only difficulty in its employment lay in the method of casting. Experience showed that full round castings of zinc would not succeed by means of the traditional closed loam molds, and it is the merit of the above mentioned foundry to have introduced a new method which offers many considerable advantages over the old one. The principle of this new method lies in the casting of zinc in different parts in open sand molds, and in joining such parts afterward by soldering. This process has now been brought to extraordinary perfection, and, united with some modes of pressing sheet zinc into ornamental articles, and of producing small hollow castings by means of cast iron molds, forms the principal industry of large establishments.

Great progress in the application of zinc was also made by substituting it for tin as a protecting coat for iron articles, chiefly for iron sheets for roofing, etc. The first patent for coating iron with zinc was granted to Mr. H. W. Crawfurd, of England, in 1837. His process, described in the "Repertory of Patent Inventions," is almost similar to that still in use at our present galvanizing works. It consisted briefly in cleaning the iron objects by immersion in a bath of water acidulated with sulphuric acid, scouring and washing them afterward, and dipping them into melted zinc covered with a layer of sal-ammoniac. They were then slowly removed to allow the superfluous zinc to drain off, and thrown, whilst hot, into cold water. Iron treated in this way shows a great resistance to the destructive influence of the atmosphere, and the application of this process, therefore, came soon into general use. We may estimate the quantity of spelter now consumed in Europe for galvanizing purposes to be above 10,000 tons per annum. The above named properties of zinc rendered it one of the most useful metals; and, moreover, if we add to this its high importance for the electric telegraph, and its enormous consumption in the form of sheets, as well as oxide, we can readily account for the present great development of the spelter trade. It is impossible to name all the purposes for which zinc sheets have been introduced, with almost unparalleled success, during the last 30 years, and the number is still evidently increasing. It will probably be the subject of an extra paper to go more extensively into this matter, in connection with the rolling process and the manufacture of zinc oxide.

With the beginning of the fourth decenary of our present century we find metallic zinc to have gained ground so far in manufacture and art that it appeared quite indispensable to them. In the chief calamine districts of Europe large companies were formed for extracting and working the metal, and, though some great fluctuations in the zinc market were experienced, as, for instance, in the years 1848 and 1849, when the price of zinc in Breslau (capital of Silesia) declined to an average of about $55 per ton, yet a rapidly increasing demand and a proportionate production always followed.

The largest establishments for smelting and manufacturing the metal are those of the Vieille Montagne Company, in Belgium; the Schlesische Actiengesellschaft, in Silesia; and the works of Messrs. Vivian & Sons, in England. The metal has attained an importance through the whole civilized world, which places it amongst the most valuable treasures of national wealth in several countries, and ranges it, by its applicability and cheapness, next to iron amongst our most useful metals. Large quantities are annually exported to the remotest places of the globe, and it is curious, and no less satisfactory, to note the alteration in the direction of the spelter trade. Two hundred years ago we find the metal was exported from India to Europe. Now large shipments of it (by far larger quantities than we ever received) are being made from Europe to Asia.

A recent invention relating to the casting of chilled car wheels consists in constructing the metallic annular chill with annular air chambers at the points of the interior surface of the chill where the outer periphery of the flange of the wheel is formed, and also at the points where the outer horizontal surface of the tread is formed, by means of which the central portion of the tread which receives the greatest wear is allowed to harden; but the other periphery of the flange and the outer surface of the tread are prevented from rapid cooling by the new conducting air chamber, and the metal at these points is molded and preserved in its full strength and tenacity, which is said to be a result to be greatly desired in view of the fact that, while the process of chilling hardens the iron, it greatly impairs its tenacity and strength.

The principal iron mines of Russia are situated in the Grand-Duchy of Finland, in the Oural, the basin of Olonetz in Central Russia, in Poland, and Southern Russia. Ironstone is not only found in mines but in the marshes of Finland and of Southwestern Russia, in Volhynia. The ore is found mixed with organic substances, sand and clay earth. The entire absence of phosphoric acids adds to its excellent quality. Local makers extract by means of little open hearths or mere holes in the ground. The iron foundries in 1873 were 202 in number, blast furnaces 150. Their product for that year was 336,430 tons of pig, 32,571 tons of castings, 260,959 tons of finished iron, 8188 tons of steel. The Russian founders are now showing great skill in utilizing old rails.

USE THE BEST.

Pawtucket, R. I.

The American File Company have the exclusive right to use the Bernot process for cutting files By this method all the advantages of hand cutting are secured, together with an accuracy unattainable in hand work. They are the only manufacturers who employ machinery for testing files and steel.

Goods of all known manufacturers have been repeatedly tested, and interesting tables have been compiled showing the working qualities of files made by different makers, and of files made from different steels, and with various shapes and angles of tooth They have thus reduced the manufacture of files to an exactness and perfection with a uniformity of result, as they believe, never before attained. No file, foreign or domestic, that they have ever tested, has equalled the performances of their own goods taken at random from their stock. Their machines are capable of the most delicate adjustment, and can produce the very finest work known to the trade. Special files made to order. Prominent file manufacturers are having their best goods from our works.

Price lists and information furnished on application.

AMERICAN FILE CO., Pawtucket, R. I.

THE BEST IS THE CHEAPEST.

McCaffrey's Standard American Hand Cut Files and Rasps are warranted to do more work than any other files and rasps in the market.

SILVER MEDAL. TRADE MARK. HIGHEST PREMIUM.

PENNSYLVANIA FILE WORKS.

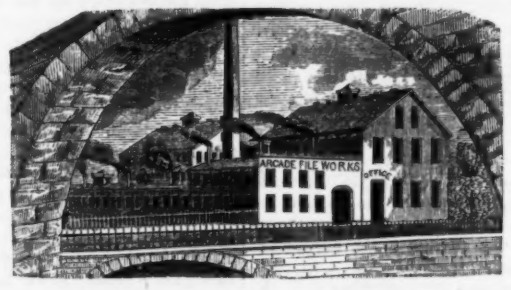
McCAFFREY & BRO.,

No. 1732, 1734 & 1736 North Fourth St., Phila.

Messrs. ARNOLD & CO., 310 California St., San Francisco. Sole Agents for the Pacific Coast.

ESTABLISHED 1848.

C. T. DRAPER & CO.
Sing Sing, N. Y.
Manufacturers of SUPERIOR HAND CUT



FILES and RASPS
Made from Best ENGLISH CAST STEEL.
Quality guaranteed by written warranty when required.

JOHN ROTHERY'S

Celebrated Hand-Cut FILES,

Made of Best English Cast Steel.

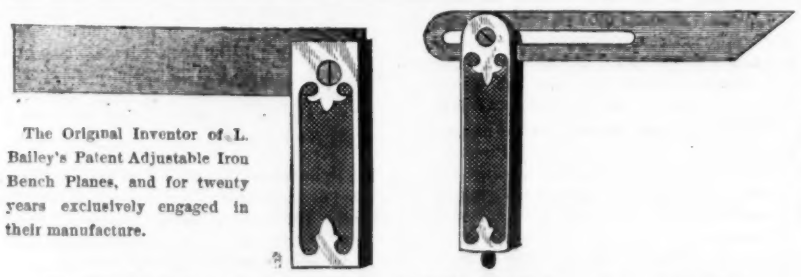
WALSH, COULTER & FLAGLER, Sole Agents,
83 Chambers and 65 Reade Streets, N. Y.

CHARLES B. PAUL,

Manufacturer of HAND-CUT **FILES.** Warranted CAST STEEL.

187 Tenth Street, Williamsburgh, New York.

All descriptions of Files made to order. Price List mailed on application. **Established 1868**



The Original Inventor of L. Bailey's Patent Adjustable Iron Bench Planes, and for twenty years exclusively engaged in their manufacture.

LEONARD BAILEY & CO.,

Manufacturers of

SUPERIOR

Mechanics' Tools.

TRY SQUARES, BEVELS, &c.

Cushman Street, HARTFORD, CONN.

W. C. DUYCKINCK,

Importer and Manufacturer of
Steam Water Gauges,
Pipe and Fittings,
Scotch Glass Tubes,
Tube Expanders,
Twist Drills,
Emery Wheels,
Pipe Fitters' Tools,
Moulders' Tools,
Blacksmiths' Tools,
Machinists Fine Tools
Forges,
Hammers,
Wheelbarrows,
Wrenches,
Jack Screws,
Vises,
Flue Brushes,
Waste,
Belting,
Hose,
Packing,
Stubs' Goods,
Hair Felt,
Polishing Felt,
Emery Cloth,
Hand Drills,
Iron Punches,
Iron Shears,
Files,
Governors,
Bolts,

Railroad & Machinists' Supplies.

SEND FOR PRICE LIST.

50 and 52 JOHN STREET, NEW YORK.

ELIAS G. HELLER. PETER J. HELLER. GEO. E. HELLER. JOHN J. HELLER.

HELLER & BROS. T M NEWARK, N.J.

We invite the attention of the trade to our Celebrated American

Horse Rasps and Files,

made from the very best American Steel, all cut by hand, and warranted to give entire satisfaction. If requested, we will send sample lots, to be returned or held subject to our order, free of all charges, if not found as represented. All Rasps not stamped as the annexed incorporated trade mark are not genuine. Sold by Hardware dealers generally.

Putnam's Government Standard FORGED HORSE SHOE NAILS.

Manufactured from the best of **NORWAY** Iron, and warranted to give entire satisfaction.

S. S. PUTNAM & CO.,
NEPONSET, MASS.

A. PARDEE, Hazelton, Pa. J. G. FELL, Phila.

A. PARDEE & CO.,

303 Walnut St.,
PHILADELPHIA

MINERS AND SHIPPERS OF

Lehigh Coals.

The following superior and well-known Lehigh Coals are mined by ourselves, and firms connected with us, viz.

A. Pardee & Co.	HAZLETON, CRANBERRY, SUGAR LOAF
G. B. Markle & Co.	JEDDO, HIGHLAND.
Pardee, Bro. & Co.	LATTIMER

OFFICES:

WM. LILLY, Mauch Chunk, Pa.
WM. MERSHON, Agent, 111 Broadway N.Y
WM. H. DAVIS, Agent, Easton, Pa.

George W. Bruce,

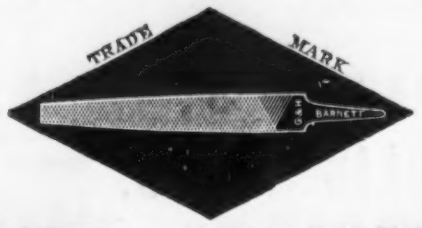
No. 1 Platt Street, N. Y., offers a full assortment of

ENGLISH and ATLANTIC SCREWS,

Iron and Brass, Flat and Round Heads, and, though the American monopolists may eventually stop the importation, his friends may rely on any orders entrusted to him being executed at the most favorable rates. An assortment in *bond for export.*

Black Diamond File Works.

Send for Illustrated Price List.



Send for Illustrated Price List.

G. & H. BARNETT. 39, 41 & 43 Richmond St. Phila.

LINFORTH, KELLOGG & CO.,

Sole Agents for the Pacific Coast, 3 & 5 Front St., San Francisco, Cal.

St. Louis, Mo., SEMPLE, BIRGE & CO., Agents.
THOS. TAYLOR, 43 Chambers St., N. Y., Agent for N. Y. and N. E. States.

Established 1816.

Peter A. Frasse & Co.,

95 Fulton Street, New York,

SOLE AGENTS FOR

Thomas Turner & Co.'s Suffolk Works,

SHEFFIELD.

FILES AND HORSE RASPS,

And Importers of

P. S. **STUBS' FILES, TOOLS & STEEL,**

W. J. Davies' Sons' London Emery Cloth,

HUBERT'S FRENCH EMERY PAPER.

AUBURN FILE WORKS,

Superior Hand-Cut

FILES AND RASPS,

MADE FROM IMPORTED STEEL. EVERY FILE WARRANTED.

FULLER BROS., Sole Agents,
89 Chambers and 71 Reade Streets, N. Y

G. WEBSTER PECK,

Manufacturers' Agent, 110 Chambers Street, N. Y.

Representing:

RACINE HARDWARE MFG. CO.,

Flower Pot Brackets, Aquaria and all kinds of Florists' Goods, Jewelers' Machinery and Builders' Hardware.

CHARLES GOOCH,	- - -	Ice Cream Freezers.
ATHRO MACHINE CO.,	- - -	Bit Braces and Flower Stands.
AMERICAN CROQUET CO.,	- - -	Croquet.
ALEX. M. LESLEY,	- - -	Refrigerators.
B. L. WALKER,	- - -	Lawn Mowers.
JOHNSON & BRO.,	- - -	Hand Made Files and Rasps.
BENJ. F. BADGER,	- - -	Razor Straps.
PEEK & SKILTON,	- - -	Rustic Work.
PALMER & SKILTON,	- - -	Nickeled Lamina Ware.
ED. C. CHASE,	- - -	Scroll Saws and Lathes.

Depot for

SIMPSON'S ADJUSTABLE PARELLEL VISES.

Send for Price Lists.

The Conn. Valley Mfg. Co.

CENTERBROOK, CONN

Manufacturers of

Lewis Patent

Single Twist Solid

SPUR BITS,

Mechanics' Double

Twist Auger Bits,

Machine Bits,

both Single and Double Twist.

Patent Countersunk Bits,

Double Cut

Gimlet Bits,

Metal Head Gimlets,

REAMERS,

Screw Driver Bits, &c.

—o—

The Lewis Pat. Bits are superior to any others in the market. They are made of best cast steel and combine the advantages of Jennings Bits, Cook's Bits and the Ship Augers.

Send for price lists and discounts.

Established 1865.

FILES & RASPS,

Best Cast Steel. HAND-CUT. Manufactured by

JOHNSON & BRO.

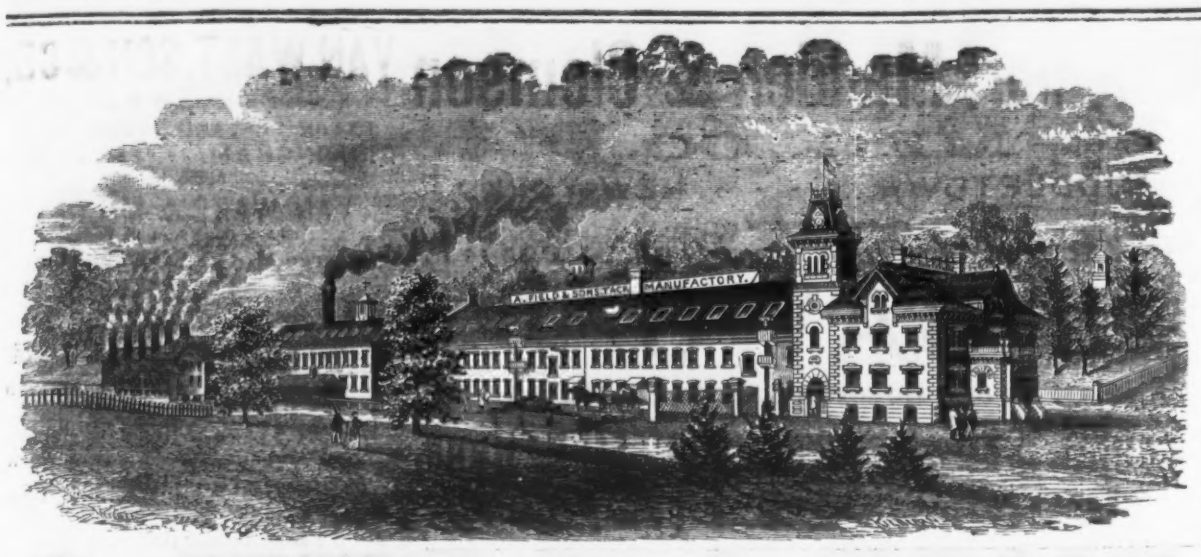
No. 1 Commercial Street, Newark, N. J.

The Original Inventors and Manufactures of the

OSBORN BRIGHT METAL CAGES.

Also OSBORN & DRAYTON improvements under twelve different patents. We are continually bringing out new and beautiful designs to meet the demands of refinement and taste.

ALVAN DRAYTON General Agent



A. FIELD & SONS,

TAUNTON, MASS., Manufacturers of

COPPER & IRON TACKS, TINNED TACKS,

SUPERIOR SWEDES IRON TACKS, for Upholsterers' Use, Saddlers' Supply, Card Clothing, etc., etc.

American and Swedes Iron Shoe Nails,

Zinc and Steel Shoe Nails, Carpet, Brush and Gimp Tacks, Common and Patent Brads. Finishing Nails, Annealed Trunk and Clout Nails, Hob and Hungarian Nails, Copper and Iron Boat Nails, Patent Copper Plated Tacks and Nails.

Fine Two Penny & Three Penny Nails, Channel, Cigar Box & Chair Nails, Leathered Carpet Tacks, Glaziers' Points, Etc.

OFFICES AND FACTORIES AT TAUNTON, MASS. WAREHOUSE AT 78 CHAMBERS STREET, N. Y.,

where may be found a full assortment of Tacks, Brads, &c., for the accommodation of the New York Wholesale and Jobbing Trade.

☞ Any variations from the regular size or shape of the above named goods made from samples, to order. ☜

OTIS PASSENGER —AND— FREIGHT ELEVATORS

For HOTELS, OFFICE BUILDINGS, STORES, WAREHOUSES, FACTORIES, MINES, BLAST FURNACES, &c.

OTIS BROTHERS & CO.

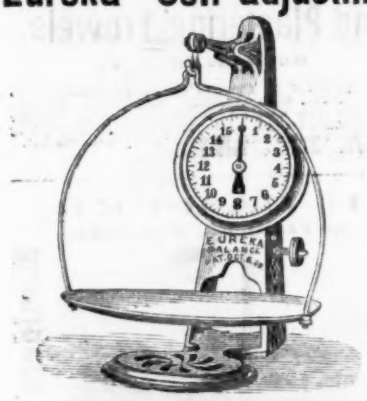
SOLE MANUFACTURERS,

348 Broadway, New York.

HOISTING Machinery

Mfd. by CRANE BROS. MFG. CO., Chicago.

Eureka Self-adjusting



SCALES.

Have a patented ***attachment for*** ascertaining the ***tare*** of a ***dish*** or other ***receptacle*** used in weighing ***without*** the use of ***weights*** or ***loss*** of ***time.*** Manufactured only by

JOHN CHATILLON & SONS,

91 & 93 Cliff St., N. Y.

OSCAR BARNETT,

Hardware and Machinery,

Gray Iron Foundries & Machine Works, Hamilton, McWhorter & Bruen Sts.,

Malleable Iron Works,

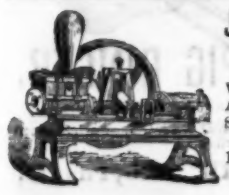
N. J. R. R. Avenue, cor. Johnson Street. Store, 31 & 33 McWhorter Street, NEWARK, N. J.

Tinning, Galvanizing, Coppering and Japanning. Small Gray Iron Castings, Soft and Smooth.

P. O. Box 24. Established 1845.

ROMER & CO.,

Established 1837. Manufacturers of Patent Scandinavian or Jail Locks. Brass Pad Locks for Railroads and Switches. Also, Patent Stationary R. R. Car Door Locks. Patent Piano and Sewing Machine Locks. 141 to 145 Railroad Avenue, NEWARK, N. J. Illustrated Catalogue sent on application.



JAS. CLAYTON,

Manufacturer of **Water, Air, and Vacuum Pumps and Air Compressors.**

Send for Illustrated Circulars.

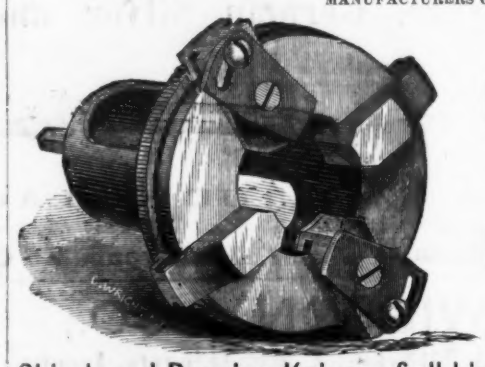
11 & 16 Water St., Brooklyn, N. Y.

THE DOUGLASS MFG. CO.,

New York Warehouse, 62 Reade Street. P. O. Box 2610.

FACTORIES, Seymour, Conn.

MANUFACTURERS OF



PREMIUM

Mechanics' Tools,

COOK'S

Boring Implements

Price List and Discount Sheet furnished on application.

Chisels and Drawing Knives of all kinds, Screw Drivers, Screw Driver Bits, Cook's and Douglass Mfg. Co. Augers & Bits, Wood and Metal Head Gimlets, Improved Hollow Augers, Blake's Patent Extension Bits,

Boring Machines, Chisel Handles, Wood Boxes, Tool Chests.

DOUGLASS' PATENT AUGER HANDLES.

Forge without Hood.

THE HURRICANE FORGE.

(Patterson's Patent.)

Prepared to Supply all Orders Promptly.

Send for Prices and further information.

GEORGE PLACE, General Agent,

121 Chambers & 103 Reade Sts., N. Y.

Forge with Hood.

LOVELL'S

Automatic Lock Hinge

STEP LADDER.

The Best and Cheapest in the World.

F. F. ADAMS & CO.

ERIE, PA.,

MANUFACTURERS OF

Pat. Wooden Articles.

We make a specialty of

WALNUT and ASH WAINSCOTING,

STEP LADDERS,

EXTENSION LADDERS,

Clothes Horses, Rat Traps,

TOWEL ROLLERS, &c.,

AND HAVE THE

Best Facilities for the manufacture of Straight and Irregular Turned Work.

The following is a partial list of the Jobbing Houses that keep our goods in stock:

Pratt & Co. .....Buffalo, N. Y.	Ames Plow Co.....Boston, Mass.	Thos. Holliday & Co., Cincinnati, O.
C. H. Walbridge & Co., " "	W. H. Banks & Co.....Chicago, Ill.	W. P. Kurtz & Co..... "
John H. Hill.....Rochester, "	David Landrath & Son....Phila., Pa.	McIntosh, Good & Co., Cleveland, O.
L. L. Thurwachter....Syracuse, "	Griffith & Page..... "	Bingham & Williamson, "
S. & P. Templeton.....Albany, "	Thos. Norris & Son...Baltimore, Md.	Poe & Breed.....Toledo, O
E. A. Burrows & Co.....Troy, "	J. Seth Hopkins & Co., " "	Ketcham & Volt..... "
Hopping Bros. & Osburn, New York.	Lindsay, Sterrett & Co., Pittsb'h, Pa.	Jno. H. Thomas & Co., Louisville, Ky
J. H. Knapp & Co..... "	Buhl, Ducharme & Co., Detroit, Mich	Morrison Bros. & Co., Hamilton Ont.

English versus American Workmen.

In pursuance of instructions, United States consuls in Europe have been supplying to their government some information relating to the laboring classes, and the chief of the Bureau of Statistics has published the results of the inquiry. The general conclusion to be drawn from the answers is unfavorable to the efficiency of English labor as compared with American. It would seem that nine hours of an American's labor are equal to about ten of an Englishman's, the superiority being nearly represented by the ratio of 10 per cent. The consuls at Bradford, Sheffield, and other manufacturing cities, and the chief of the bureau himself, came to this conclusion after much investigation. This is especially true of heavy manufacturing work, such as machine or engineering work and the fabrication of hardware, cutlery, and other manufactures of iron and steel. In all these branches 900 Americans are thought to be equal to 1000 Englishmen in the amount of work per week they will accomplish. This corresponds with the experience of our own manufacturers. It has before been observed here that in labors demanding enormous physical strength and endurance—like iron puddling—the Americans were superior to the English; while in patient, steady drudgery the British "navvy" or Irish day laborer is much beyond the Yankee; and Mr. Brassey's experience is no doubt true, that the English day laborer is the cheapest laborer in the world, because he accomplishes the most for the money. The American demands a toil with some peculiar stimulus to call out his best powers. Thus, in a dangerous and difficult employment like lumbering, demanding great strength and presence of mind, no nationality is equal to the American. The superiority, however, of which we have spoken, seems to be less true in other branches, and in cotton and woolen manufacture the British superiority is expressed by the ratios of 8 and 6 per cent. The explanation given by the report of the greater efficiency of American labor is probably the true one—that it lies in its greater "adaptability" owing to the superior education and intelligence of the American factory workman, and in the more temperate American social habits. The English workman requires a day or two to get over his Saturday night and Sunday drinking sprees. The extent to which the English laboring class drink up their wages appears in a melancholy form in this report. The Consul at Sheffield reports that great numbers of working men stop work on Saturday noon, and do not commence again till the following Wednesday. This is, in part, because they need Monday and Tuesday to enable them to recover from the effects of Sunday's drinking. "Increase of pay," says the Consul at Birmingham, "means increase of drink." In Manchester, our Consul reports that many sober working women complained that increased wages and shortened hours of labor were a curse to the families, as the men were only the more tempted to drink. In Liverpool there seems a widespread and fearful demoralization of the laboring class from their intemperate habits. And thus from almost all the manufacturing centers our officials report a wretched condition of working men's families and reduced efficiency of labor from the habits of intemperance prevalent. A curious fact also appears in these researches, namely, that a rise of wages does not always produce more work. Thus in the collieries of Leeds the product for each person in 1864 was 327¼ tons for 313 working days, or 21¼ cwt. for each person per diem. In 1868 it fell to 317 tons, or 20 cwt. per diem; in 1873 to 17¼ cwt. for each person per diem. That is a reduction of production in ten years of 19 per cent., while wages have risen 30 per cent. and upward. In Manchester the average earnings of a certain mine were 4/7 per day in 1871; in 1872 the wages had more than doubled, and yet the earnings were 2d less per week for each man. The workmen averaged less than four working days per week, while many only worked three days. The statistical proof presented by the United States Bureau of Statistics of the terrible loss and degradation to the English laboring classes produced by their drinking habits will not be one of the least of the good results accomplished by this able report.

A general interest has been excited in the town upon the subject; we append a letter upon which the *Times* founded the article quoted above:

SHEFFIELD, Jan. 22, 1874.

DEAR SIR.—In reply to your inquiries in regard to the condition of the working men of Sheffield, especially as to their habits, I have the honor to submit the following, which will be found, I think, to contain definite replies to all your questions. I have endeavored to state the facts as they are, without exaggeration. In order to do so I have made many inquiries, not merely of employers and employed, but of intelligent, candid and disinterested persons in all walks of life, especially of those who have the best means of knowing the class in respect to whom you inquire.

You ask first, are they (the workmen) industrious? If a stranger should visit this great town, with its hundreds of tall chimneys, and should go through the extensive works that annually supply the world with such immense quantities of their products, he would be very likely to come to the conclusion that this is a very busy and industrious people. There is no denying the immense results wrought out by the Sheffield workmen. They are a hard-working people—*while they do work*, but it is true that a very large proportion of them are idle a great many days in the year when they might and ought to be at work, and when their employers are needing their labor. Every Monday is so generally a holiday that it has come to be called Saint Monday. The streets on that day are full of men at leisure, and this fact cannot fail to strike a stranger, especially an American, who was not acquainted with the customs of the town. This Monday idleness is, in some cases, enforced by the fact that Monday is the day that is taken for repairs to the machinery in the great steel works, during which the masses of the men employed in such establishments must necessarily be out of work. But this will account for but a small portion of the idleness on that day. It is to a great extent voluntary, and has become a settled habit and custom. And this holiday is, in thousands of instances, protracted through the next day, so that large numbers of the workmen, stopping work on Saturday noon, do not commence again until the following Wednesday. Such men can hardly be called industrious.

From inquiry and my own observations, I believe that far the larger part of this loss of time, both for employer and employed, and the reckless waste of money consequent upon it, is the result of the drinking habits that prevail so generally. It is painful to see how the weekly wages are squandered by the thousands who throng the drinking places on Saturdays, Sundays at certain hours, Monday and Tuesday, and, indeed, on all days of the week. I would not say that Sheffield will compare unfavorably with other large manufacturing towns of England; I presume it would not, although the nature of the labor required here is such as perhaps to lead to greater temptations to drink, and to a fancied greater necessity for it, than in districts where the work is of a much lighter kind. I say fancied necessity, because there does exist here a body of men employed in the most exhausting kind of labor in our great steel manufactories who are total abstainers, and who, to say the least, have proved themselves the equals of any in efficiency and endurance.

Another great cause of waste of time and money ought to be mentioned. It is the prevalence of gambling, in the form of rabbit coursing, handicapping, pigeon shooting, and the like. This evil has become so great that a public meeting was called not long since to consider means for suppressing it.

I am quite sure that the amount of money spent in the above mentioned ways has increased with the advance in wages, and that the large amounts earned by the workingmen have not been used, except in comparatively few cases, to increase the comforts of their families. They have always lived well so far as their food is concerned. They spend their money freely for meats of the best quality, and the general appearance of the workingmen is that of a well nourished and vigorous people. There are, of course, many exceptions to this, belonging to a class far below, such as can be found in every great town.

Respectfully yours, C. B. WEBSTER,
United States Consul.

HON. EDWARD YOUNG,
Chief of Bureau of Statistics, Washington.

The Production of Iron in Prussia in 1874.

The *Deutsche Industrie Zeitung* says: Like the iron mining industry, blast furnace operations in Prussia, in 1874, suffered severely from the effects of the general dullness of trade. In consequence of the reduction, and partly, also, the total cessation of operations, especially in furnaces producing crude iron, and the considerable decline in prices of all kinds of metals, the value of the produce of the iron and steel works in Prussia showed a total decrease of £6,358,046, against that of the previous year.

The total number of metallurgical works going in 1874 was 1074; in 1873, on the contrary, 1097. Of these 150 were iron blast furnaces (in 1873, 173); 843 (in 1873, 844) other iron and steel works, 32 (against 36) zinc works, 27 (against 30) lead, silver and copper works, and 22 (against 14) antimony, arsenic, alum works, &c.

The production of iron blast furnaces and other iron and steel works was in 1874 and 1873 in quantity and value as follows:

Description.	Quantities.		Value.	
	1874.	1873.	1874.	1873.
	cwt.	cwt.	£	£
Pig iron.....	25,605,870	31,478,041	5,750,294	9,075,788
Iron castings, second melting.	6,644,889	7,184,583	3,495,791	4,355,418
Ir'n products	21,840,488	19,511,734	10,185,512	12,610,215
Steel prod'ts (crude)....	7,435,704	6,078,778	4,623,533	4,871,755
Total.....	61,526,448	64,253,126	24,055,130	30,913,176

The above values show what was the relative decrease in price of iron and steel products in 1874 against the previous year. The average value per cwt. of crude iron was 4·49/ in 1874, against 5·76/ in 1873; iron castings, second smelting, 10·52/, against 12·12/ in 1873; iron products, 9·78/, against 12·9/ in 1873; crude steel products, 12·43/, against 16·02/ in 1873. The general depreciation in value is conspicuously shown by the fact that spiegeleisen, for instance, which in 1873 had experienced a fall from 132/ to 75/ per 1000 customs pounds, found no buyers at the close of 1874 even at 51/; and common pig iron was at the same time vainly offered at 39/ to 42/.

Of the 349 iron blast furnaces of Prussia, only 245, or 70·2 per cent., were at work in 1874, against 276 in 1873. The total working time during the former year was 2114·3 months, or 603 months less than the previous year. Of the furnaces, 158 burnt coke, 15 charcoal, and 12 mixed material. The average production of each furnace was 104,512 cwt. in 1874, against 114,051 cwt. in 1873.

There were further at work in 1874:

948 cupola furnaces	against	921	in 1873.
97 reverberatory furnaces.	"	103	
1,835 puddling furnaces.....	"	1,879	
102 fining forges.....	"	103	
56 Bessemer furnaces.....	"	36	
26 Martin "	"	16	
85 crucible "	"	106	
6 converting "	"	14	

The average production per furnace was in 1874 and 1873 respectively:

Description of Furnace.	1874.	1873.	1874 more (+) or less (—) than '73
	cwt.	cwt.	per cent.
Cupola furnaces.....	6,420	7,064	— 9·12
Reverberat'ry furnaces			
Puddling furnaces.....	11,375	10,777	+ 5·55
Fining forges.....	6,211	2,742	+126·51
Bessemer process.....	71,763	70,270	+ 2·12
Martin furnaces.....	12,155	19,060	— 36·23
Crucible furnaces.....	1,091	947	+119·51
Converting furnaces...	6,333	2,866	+120·97

The number of workmen employed in iron and steel furnaces was 110,986 in 1874, against 112,238 in 1873.

GEORGE GUEUTAL & SON,

39 West 4th St., New York.

IMPORTER OF

Wood Screws, Steel in Sheets,

BAND SAWS. TOOLS FOR BRAZING, &c.

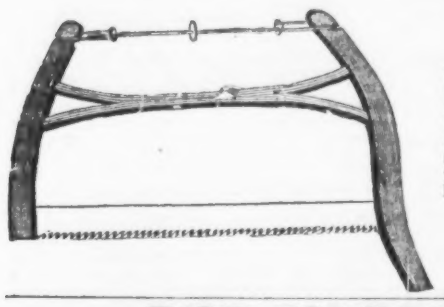
Bed Screws, Pin Hinges, and Wire Nails a Specialty.

H. W. PEACE,

MANUFACTURER OF

Saws of all kinds.

FACTORY, WILLIAMSBURGH, N. Y.



Elliptic Forked Saw Frame.

Patented June 28th, 1870.

The annexed engraving represents my ELLIPTIC FORKED SAW FRAME, which commends itself to the trade for its simplicity of construction. The Forked Brace being all in one piece, without any center bolt, secures for the Frame great strength and durability. These Frames are put up with my best Webs, marked "No. 40, Harvey W. Peace."

HARVEY W. PEACE,
Sole Proprietor & Manufacturer,
VULCAN SAW WORKS.
WILLIAMSBURGH, N. Y.

THE SILVER STEEL DIAMOND CROSS-CUT SAW.

$1.50 Per Foot.

PATENT HANDLES AND GAUGE INCLUDED.

Patent Secured

THIS new Saw, which is destined to take the place of all Cross-cut Saws in point of **SPEED AND EASE**, is manufactured by E. C. ATKINS & CO., Indianapolis, Ind., who are the

SOLE MANUFACTURERS FOR THE UNITED STATES.

So confident are we that this is the best Cross-cut Saw in the market that we CHALLENGE THE WORLD. Orders promptly filled.

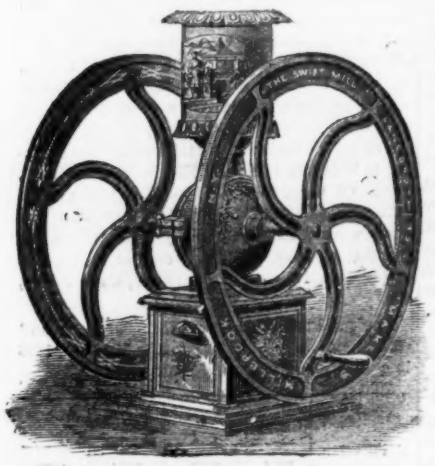
E. C. ATKINS. H. KNIPPENBERG.

E. C. ATKINS & CO.
Saw Manufacturers and Repairers, Indianapolis, Ind.

THE

SWIFT MILL.

ESTABLISHED 1845.



No. 16.

The annexed cut shows one of the many styles of Coffee Mills of our manufacture, especially adapted to Grocers' use and all retailers of coffee. They are highly ornamental, and workmanship of the very best. Silver Medal awarded at the Great Fair of American Institute last autumn. We make more than 30 styles.

ALSO

Lane's Portable Coffee Roaster

Will roast 30 to 40 lbs. at once, and can be used as a stove at other times.
Send for descriptive list.

GENERAL AGENCY:

S. HAVILAND & SON,
259 Pearl St., N. Y.

LANE BROS.,
Millbrook, N. Y.

Also sold by leading wholesale houses.

The Cowles Hardware Co.,

UNIONVILLE, CONN., Manufacturers of

HARDWARE & HOUSE-FURNISHING GOODS.

GEO. DUNHAM, Prest. G. S. KNAPP, Treas. MARTIN COWLES, Sec

Punches and Screw Drivers of all varieties, Box Scrapers, Box Openers, Garden Hoes, Garden Trowels, Border Knives, Mincing Knives, Fish Turners, Butter Knives, Cake Turners, Cleavers, Hammers, Carpet Stretchers, Tack Claws, Marking Awls, Carpenters' Awls, Belt Awls, Ice Awls, Carriage Jacks, Nail Sets, Bush Hooks, Ice Axes, Ice Tongs, Patent Mouse Traps Vegetable Slicers, Bit Braces, Butts and Spiral Springs, Ferrules, Ham Tryer, Ham Stringers, Oyster Knives, Cold Chisels, Handles, Solid and Prick

IMPLEMENT SCREW DRIVERS.

Catalogues and Circulars sent on application.

Wheeler, Madden & Clemson MFG. CO.,

MIDDLETOWN, - - - - NEW YORK.

Manufacturers of

WARRANTED CAST STEEL

SAWS

Of every description, including

Circular, Shingle, Cross-Cut, Mill, Hand,

WOOD SAWS, Etc., Etc.

AMERICAN SAW CO.,

Manufacturers of

Movable Toothed Circular Saws,

PERFORATED CROSS-CUT SAWS

And SOLID SAWS of all kinds. Trenton, N. J.

GREENFIELD TOOL CO.,

Greenfield, Mass.

Sole Manufacturers of the Celebrated

"Diamond" PLANE IRONS,

EXTRA PLATED TABLE CUTLERY. PATENT FORGED OX SHOES. The only Shoe made with concavity to fit hoof. BENCH AND MOULDING PLANES of every description, &c., &c. Drop Forgings to order. Address for Catalogue with stamp.

VAN WART, SON & CO.

Hardware Commission Merchants.

EXPORTERS AND IMPORTERS,

BIRMINGHAM, - ENGLAND,

Agents,

VAN WART & McCOY,
194 & 196 Duane Street, N. Y.

George H. Gray & Danforth,
48 India Street, Boston.

F. W. TILTON,
17 Old Levee Street, New Orleans.

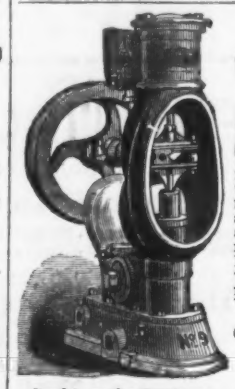
At each of these places a complete assortment of samples of Hardware and Fancy Goods will be found, including all new descriptions. Sole Agents for

John Rimmer & Son's Celebrated Harness and other Needles.

W. Clark's Genuine Horse Clippers.

Seydel's "Ashantee" Pocket Hammock

OSCAR IRVING VAN WART & Co.,
FORWARDING AGENTS.
2 South John Street, LIVERPOOL.



WASHINGTON, D. C., Sept. 13, 1875.

JNO MAYER,
Treas. Valley Machine Co., East Hampton, Mass.

DEAR SIR: The "Wright Bucket Plunger Steam Pump" you built for the Government "works like a top." Am sure it has never had its equal in any of the departments, and I have no hesitancy in recommending this Pump to any one in want of a first-class, noiseless Steam Pump. Very respectfully,

J. THOS. MILLER,
Chief Engineer U. S. House of Representatives.

Send to us for Catalogue.

Valley Machine Co.

HALL, ELTON & CO.,

Electro Plated Ware, German Silver and Britannia Spoons.

THE "PALACE."

Factories, Wallingford, Conn. **Salesroom, 75 Chambers Street, New York.**

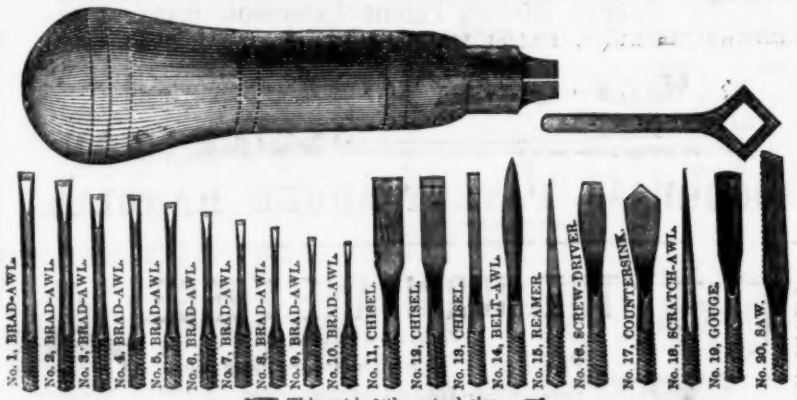
J. CLARK WILSON & CO.,

Manufacturers & Jobbers of Hardware, & Manufacturers' Agents.

81 BEEKMAN STREET, N. Y. P. O. Box 2355.

REDUCED PRICE OF

H. CLARK'S SUPERIOR BRAD AWLS AND TOOLS.



This cut is ¼ths actual size.

No. 1, Brad Awls only (10 awls), Polished Apple Handles.....per dozen, $10 50
No. 2, " and tools (23 tools), Polished Apple Handles..... " 12 50 ...Discount 50 %

Packed in **Black Walnut** boxes with slide covers, **of 1-2 doz. each.**

Also, Agents for WILDER'S SOCKET SCRATCH AWLS.

WARRANTED CAST STEEL.

Packed in Paper Boxes of one dozen each.....$1 50—Discount 20 %

J. FLINT,

Manufacturer of

ALL KINDS OF

SAWS

And Plastering Trowels,

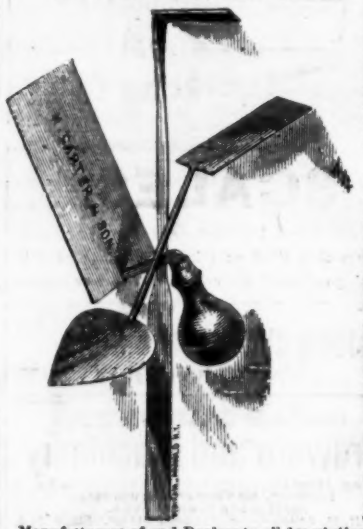
ROCHESTER, N. Y.

A large Stock of **Cross Cut Saws** constantly on hand. Orders filled promptly. **Dietrich's Double Handle One Man Cross Cut Saw** made with any kind of tooth desired. Our patent method of grinding Hand Saws makes them superior to any in the market. Send for Illustrated Price List.

H. CARTER,

290 PEARL ST., NEW YORK.

Moulders' and Plasterers' Tools.



Manufacturers of and Dealers in all descriptions of Moulders and Plasterers' Tools, and Dealers in General Hardware, Gilded Copper Weather Vanes, CARTERS' PATENT CARRIAGE LIFTING JACK, &c.

THE HARTFORD FOUNDRY AND MACHINE CO.,

Successors to the

WOODRUFF & BEACH IRON WORKS,

Hartford, Conn.

J. S. HUNTER,
President.

E. J. MURPHY,
Treasurer & Secretary

High & Low Pressure Marine & Stationary

Steam Engines

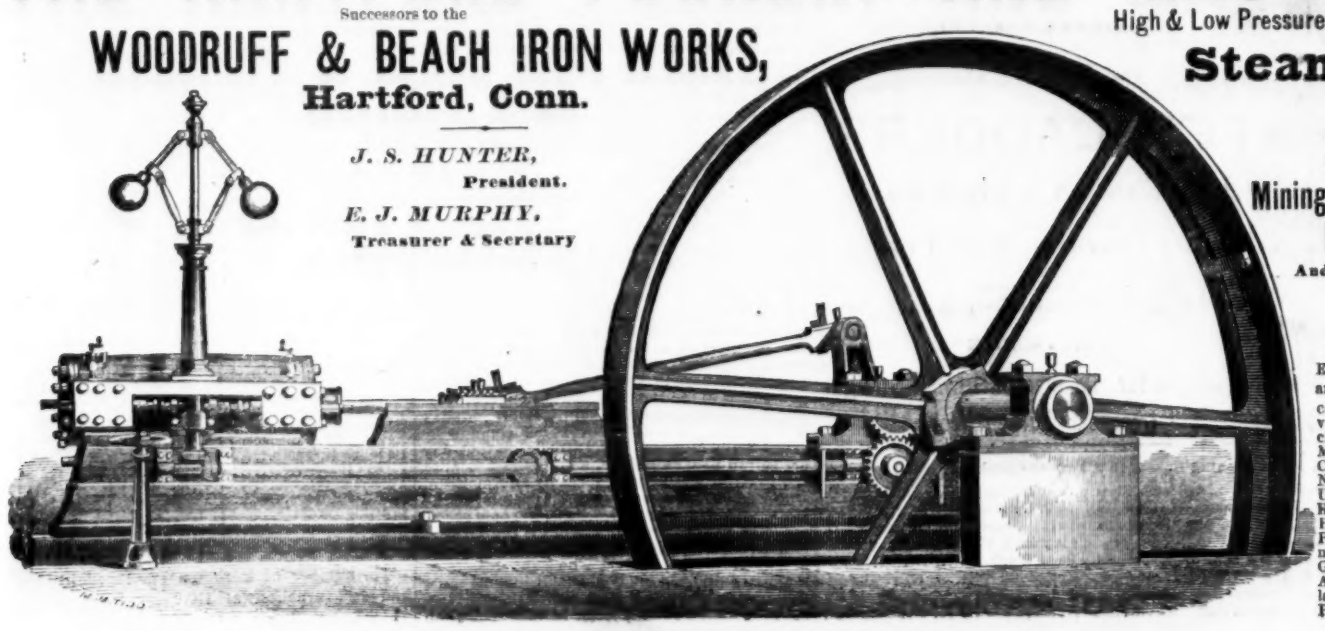
AND

Boilers,

Mining, Powder and Paper Mill

Machinery,

And every Variety of Iron and Composition Castings made to order.



The following are a portion of the Engines manufactured at these works and are a sufficient guarantee of our capacity for doing first-class work, viz.: The Pumping Engines in the cities of Brooklyn, N. Y.; St. Louis, Mo. and Hartford, Conn., and in the Charlestown, Mass. and Norfolk, Va. Navy Yards, and the engines in the U. S. Steam Sloops of War Michigan, Kearsage, Manitou, Minnetonka and Piscataqua and the Gun Boats Cayuga, Pequot and Nipsic, the Government Transports Dudley Buck and Geo. C. Collins, and the Steamships America and United States. Also the large Horizontal Engine for the new Plate Mill of the Bay State Iron Co.

PUMP AUGERS and REAMERS

A SPECIALTY.

1760. 1875.

Solid Cast Steel Pump Augers

A full line always in stock. **Socket Shanks, Ring Handles, and Connecting Rods,** furnished to order. Send for Price Lists to

CHAS E. LITTLE, 59 Fulton St., N. Y.

HOG and PIG RINGER.

Patented March 17, 1874.

MAKES TWO SIZED RINGS. Satisfaction guaranteed. Send for prices.

E. BLAIR, Bucyrus, O.

Cutlery.

THE LAMSON & GOODNOW MFG. CO. 88 CHAMBERS ST. N.Y. AMERICAN TABLE CUTLERY &c.

NORTHAMPTON CUTLERY CO.,
Manufacturers of all kinds
American Table Cutlery,
Ivory-Plated, Cook, Butcher, Shoe and Hunting Knives.
THEODORE WEED, Manager, 45 Murray Street, N. Y.

FRIEDMANN & LAUTERJUNG,
MANUFACTURERS OF
Pen and Pocket Cutlery, Solid Steel Scissors, F. & L. Shears, Razors, Russia Leather Strops, Oil and Water Hones, &c.
Sole Proprietors of the renowned full concaved patent
"ELECTRIC RAZORS."
Also Agents for the BENGALL RAZORS.
American Table Cutlery, Butcher Knives, &c.
91 Chambers and 73 Reade Streets, NEW YORK.
423 N. Fifth Street, ST. LOUIS, MO.

TABLE KNIVES AND FORKS OF ALL KINDS,
AND ORIGINALLY EXCLUSIVE MAKERS OF

Also the exclusive makers of the "Patent Ivory" or Celluloid Knife, which is the most durable White Handle Knife known. These Handles never get loose. Always call for the "Trade Mark" "MERIDEN CUTLERY COMPANY" on the blade. Warranted and sold by all dealers in Cutlery, and by the MERIDEN CUTLERY CO., 49 Chambers Street, New York.

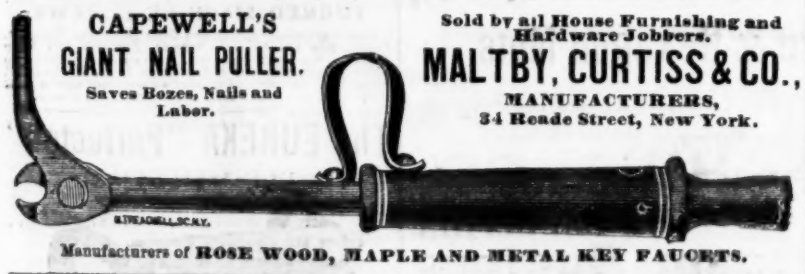
THE MILLER BROTHERS CUTLERY CO.,
Manufacturers of
PATENT FINE PEN & POCKET CUTLERY
WEST MERIDEN, CONN.
The **only Knives made** that are put together in such a manner that there is no strain on the covering or frail part of the knife. We warrant our knives equal in cutting qualities and workmanship to any made, and are acknowledged by English makers as the **Best American Knife.** We also make
NICKEL & SILVER PLATED POCKET KNIVES
which will not rust or become discolored when used as a Fruit Knife, and their cutting qualities are equal to any other knife. Orders filled from the factory, and in New York by **Messrs. J. Clark Wilson & Co.,** No. 81 Beekman Street (who have a full stock of all patterns always on hand), and also by **Messrs. G. B. Walbridge & Co.,** No. 99 Chambers Street.

Naugatuck Cutlery Co.,
Manufacturers of FINE
PEN and POCKET CUTLERY.
FULLER BROTHERS, Sole Agents, 89 Chambers and 71 Reade Sts., N. Y.

JOSEPH RYALS, Collinsville, Conn.,
Manufacturer of Patent

SHEARS & SCISSORS.
Made by a new process RECENTLY PATENTED which enables me to produce goods that in quality, finish and general excellence surpass any. *All warranted Solid Cast Steel Blades.*

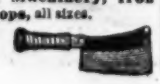
CAPEWELL'S GIANT NAIL PULLER.
Saves Boxes, Nails and Labor.



Sold by all House Furnishing and Hardware Jobbers.
MALTBY, CURTISS & CO.,
MANUFACTURERS,
34 Reade Street, New York.
Manufacturers of **ROSE WOOD, MAPLE AND METAL KEY FAUCETS.**

ESTABLISHED 1852.
NEW YORK KNIFE CO.
MANUFACTURERS OF SUPERIOR
Table & Pocket Cutlery,
WARRANTED TO BE MADE OF THE BEST MATERIAL.
WALKILL RIVER WORKS,
Walden, Orange Co., New York.
THOS. J. BRADLEY, President.

CHARLES E. LITTLE,
59 Fulton St., New York,
Dealer in Specialties, viz: Agent for Merchant's Doweling Machines, Tools for Butchers, Coachmakers, Coopers and Slaters,
Silver & Deming's Coach Machinery, Iron and Wood Truss Hoops, all sizes.
Tool Chests, First-Class Tools.
Send for Price Lists.



X. L. C. R. X. L. C. R.
EMANUEL MARX,
IMPORTER OF
Table & Pocket Cutlery,
Solid Steel Shears, Britannia Spoons, Britannia Soup Ladles and Toy Casters.
OFFICE & WAREROOMS, 106 Chambers Street, near Church, New York. Sent for Price List.

AMERICAN PEN AND POCKET KNIVES,
MANUFACTURED BY PEPPERELL, MASSACHUSETTS
Aaron Burkinshaw. AB
My Blades are forged from the best Cast Steel, and warranted. To me was awarded the GOLD MEDAL of the Connecticut State Agricultural Society; also a [illegible] and Diploma from the Mass Mechanics' Ass'n Sept., 1[illegible].

FURNESS, BANNISTER & CO.
Manufacturers of
Fine Table CUTLERY.
Cor. Nassau & Sheffield Sts.,
NEWARK, N. J.

Cutlery.

KING, BRIGGS & CO. 80 CHAMBERS ST. NEW YORK
ENGLISH HARDWARE.
WOSTENHOLM'S IXL POCKET KNIVES,
KNIVES & FORKS, RAZORS,
SCISSORS, FILES CHAINS
ANVILS, VISES GUNS.

JOSEPH S. FISHER,
No. 411 Commerce St., PHILADELPHIA
AGENT FOR
George Wostenholm & Son,
"Limited."
Washington Works, SHEFFIELD,
Celebrated I-XL Cutlery, Razors, &c
AGENT FOR
WALTER SPENCER & CO.,
Steel and File Manufacturers,
Rotherham, ENGLAND.
Corporate Mark.
SPENCER ROTHERHAM
Granted 1777.

F. W. HARROLD,
Birmingham and Sheffield,
ENGLAND.
Importer on Commission
OF
HARDWARE, CUTLERY, GUNS, &c.
W. SANDERS, Agent,
78 Chambers Street, N. Y.

CORPORATE MARK,
Joseph Rodgers & Sons'
(LIMITED)
CELEBRATED CUTLERY,
No. 82 Chambers Street, New York.
F. & W. CLATWORTHY, Agents.
The demand for **Joseph Rodgers & Sons'** productions having considerably increased, they have, in order to meet it, greatly extended their Manufacturing Premises and Steam Power.
To distinguish Articles of **Joseph Rodgers & Sons'** Manufacture, please to see that they bear their Corporate Mark.

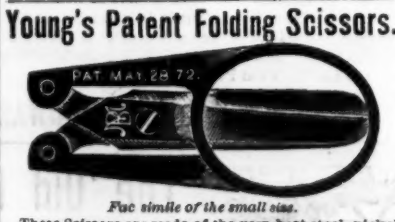
ASLINE WARD,
101 and 103 Duane Street, N. Y.
REPRESENTING
GEO. WOSTENHOLM & SON,
"LIMITED."
CUTLERY AND RAZORS,
Washington Works, Sheffield.
CORPORATE MARK.
I·X·L
FREDERICK WARD & CO., Sheffield,
Cutlery and Table Knives.
CORPORATE MARK.
B4*ANY

R. HEINISCH'S SONS,
(Successors to R. HEINISCH)
Manufacturers of their

Patent Tailors' Shears.
SCISSORS AND TRIMMERS.
301 Broadway, *NEW YORK.*

KANN & SONS MFG. CO.
Manufacturers of Albata & Britannia
TEA and TABLE SPOONS,
Caster Frames, Ladles, &c.
93, 90 & 92 N. Holliday St., Baltimore, Md.

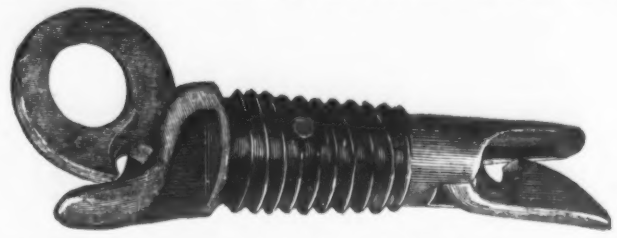
Young's Patent Folding Scissors.



Fac simile of the small size.
These Scissors are made of the very best steel, nickel plated, and so constructed that they can be readily folded and carried in the pocket without injury to the garments. A sample pair will be sent by mail, *to the trade only*, upon receipt of the retail price, namely:
For small size, either blunt or pointed.....$1·00
Large size, pointed or half pointed.....1·50
New York, Feb. 1st, 1876.
MARX BROS., Proprietors,
430 Broadway.

Washburn's Improved Screw Blind Fast.

This blind fast secures the blind firmly and noiselessly. This is done by means of the extended lip on the screw-shell, which grasps the catch and holds it after the manner of the thumb and finger, as will be seen by inspection of the cut. The spring used is steel music wire, the object being to have the best possible material, and render this portion as durable as any other part of the fast. The method of insertion is very simple; a five-eighth hole is bored in the



blind, and the fast is screwed into place. It is claimed that these are the simplest blind fasts in the market. These goods are manufactured by B. D. Washburn & Co., 35 and 37 Batterymarch street, Boston, Mass.

PHILADELPHIA CORRESPONDENCE.

Office of *The Iron Age*, 220 South Fourth st., PHILADELPHIA, Feb. 8, 1876.

After a few days of sharp frost, we have again a change back to the genial spring-like weather to which we are becoming accustomed, and winter seems to be as far off as ever. The effect on some branches of business is quite depressing, while others are deriving important advantages; for instance, the arrivals at our port during last month are 155 more than for the corresponding month of the previous year—the foreign arrivals being 78 more. Our exports for the same period also shows an increase of over 100 per cent., and which, if continued (as there is every reason to believe it will be), must have an important influence upon general business.

There is no improvement to note in the leading features of the coal trade, though the cold weather of the past few days has somewhat stimulated the retail trade. There are efforts making in the Cumberland region to reduce the cost of production and delivery at tide water, but they do not meet with much success, owing to the action of one of the leading companies. Gas coals have opened at 50 cents per ton lower than last year for Pennsylvania and Westmoreland, and large contracts have been made for the ensuing year. The suspension of labor in the Pennsylvania anthracite coal mines commenced yesterday, and 60,000 men and boys will be thrown out of employment for the next five weeks. The railways connected with the coal interests have also generally ceased work, and their workshops are all closed. This suspension will undoubtedly cause great distress among the work people of the district, but as they understand the suspension to be one of necessity, they are likely to accept the situation without causing any disturbance. Warning of the suspension was given in due time, and the men have had some opportunity to make preparation for it, and as the outlook for the spring trade is fairly encouraging, they are more cheerful than they would otherwise be.

The iron trade shows very little animation, but the feeling prevails that bottom has been touched, and they can now afford to wait for the turning point. The pressure to sell is scarcely so great as it was a little while ago, and as the demand is at least equal to the production, it is not likely prices can recede much further; beside, present rates are said to be unremunerative, so there is no inducement for an increased production, and those who hold stocks are in a position to carry them, in preference to sacrificing to realize.

We regret to have to announce the decease of Mr. Robert B. Cabeen, of the firm of Cabeen & Co., 409 Walnut street. Mr. Cabeen, though attending to business up to a few days previous to his death, contracted a severe cold some months ago, which finally developed into pneumonia, of which he died on the 3d inst., in the 65th year of his age. Mr. Cabeen long held the position of one of our leading iron merchants. He was also for 12 years one of the most active directors of the Philadelphia and Reading Railroad, and was regarded as a man of the strictest integrity and of sterling worth. At a meeting of the iron merchants, held on Thursday afternoon, presided over by Franklin Dundore, Esq., resolutions of respect for his memory and condolence with his family were unanimously passed.

The arrivals of exhibits for the Centennial are quite numerous, and are rapidly being placed in position. One-half of all the English exhibits are already on the spot. The Swedish steamer Heimdahl arrived yesterday with a portion of the Swedish contributions, as also some from Newcastle-on-Tyne. The foreign exhibitors have been given the position of honor at the east end of Machinery Hall, where the grand entrance is. England, that furnishes from one-half to two-thirds of the whole foreign display, occupies the most important places in the center, and in the north avenue is opposed to Belgium, Russia and Brazil. In immediate proximity to Great Britain, and on the same side of the avenue, is the machine making display of the firm of Wm. Sellers & Co. Adjoining is the great gun factory of Whitney, and the display here will be, to professional men, one of the most interesting in the building, for no less than 60 pieces of machinery will be shown in active operation, and the whole method of gun making displayed. The Baldwin Locomotive Company will make a superb display of locomotives; these will be in full motion, and will include the Don Pedro, ordered by the Emperor of Brazil, and permitted by him to remain during the Exhibition. Outside the building are many competitive displays, which are not exactly suited for the interior, such as boilers, brake machines, stone cutting machines, emery grinders, &c. It must be remembered that upon the boilers outside fully one-third of the locomotives and stationary engines displayed rely for their power. No less than fifteen boilers have been promised, for which pits are now being dug, and brick frames and foundations built. The first annex is west of the pump house, and nine boilers are located in the front section. In the rear are machines on exhibition which might be unpleasant in the interior—steam hammers, furnaces, forges, stone cutting, polishing, emery grinding, which is carried to immense perfection by Americans, whose work is estimated vastly more accurate than Europeans. The calender rolls for paper mills are not ground by a lathe, but by emery wheels, which move, suspended by callipers, along the side of the roll. This very interesting process is shown in the interior of the main building, but in this annex is shown only the coarser work done by the emery wheel. In the second annex, the front section is occupied by the Centennial machine shop, and the tools for use are displayed here. In the third annex the front section has the remaining six boilers, and all the hoisting machines to be exhibited will be located here, and the process of hoisting will be displayed. In the rear will be all the patent brick making machines. The English, who have backed up this Centennial with the most cordial co-operation, are now building a boiler house of their own, on the east side of the pump annex. The six boilers in the third annex supply power to nineteen steam engines, located in a group; the Buckeye Engine Company furnish an engine which drives the brick machines, and Harrison & Whitehall drive the stone cutting and polishing processes. Altogether inside and out there is one mile and a half of shafting.

The Centennial Programme of the American Institute of Mining Engineers.

We have received a circular letter from Mr. W. G. Neilson, secretary, detailing the plan of the American Institute of Mining Engineers with regard to the Centennial, of which the following is the substance:

The city rooms of the Institute at 1123 Girard street, Philadelphia, will be open day and evening, from April 1 to December 1, 1876, for the use of members and associates, and of other persons, citizens or foreigners, properly introduced. Arrangements are also in progress to secure a headquarters for the Institute within the Centennial grounds; but the special purposes of the city rooms are such as could not be so well served by accommodations exclusively in the Exhibition.

These rooms are intended to be:

1. A center of social reunion for all members and associates in the city.

2. A convenient resort for foreign engineers, metallurgists, geologists, etc., desirous of meeting their American colleagues, or of obtaining information and assistance in their study of American resources and industries.

3. A repository of statistical and other information concerning the mining, metallurgy, geology and geography of the United States, which can be consulted by members or guests, in connection with the study of these subjects in the Exhibition.

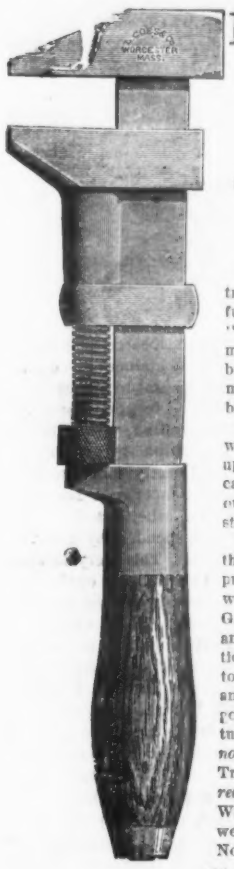
4. An agency and directory for the convenience of members and guests in arranging tours, forwarding letters, storing packages, etc.

To carry out these plans, the committee has secured, at the above address, a suite of apartments, comprising three rooms on the ground floor, a room in the second story, and a room for storage in the basement. These will be suitably furnished and attended, and provided with the daily journals, scientific periodicals, geological and professional reports, maps, portfolios of drawings of machinery, descriptions of works, guide books, railway tables, etc., for consultation; beside which, the secretary will be prepared to furnish information, advice and letters of introduction to members or guests interested in special lines of professional inquiry, whether in the Exhibition itself or in the country at large. It is probable that, beside the ordinary social and professional use of the rooms, meetings for informal discussion will be held in them on one or two evenings of each week. A register of the addresses and movements of members and guests will be kept, so that the present or prospective address of each may be known at any time. If it shall prove desirable, a copy or abstract of this register, or so much of it as shall show the addresses, from day to day, of mining engineers, metallurgists, geologists, etc., present in the city, will be kept at the headquarters of the Institute in the Exhibition. In connection with this registry, the committee will receive and forward letters and store baggage, specimens, etc., at the order of their owners, these facilities being extended to all members and associates of the Institute, and others who shall have become entitled by proper introduction to the privileges of the rooms.

L. COES'

Genuine Improved Patent

SCREW WRENCHES.



Manufactured by

L. COES & CO.,

Worcester, Mass.

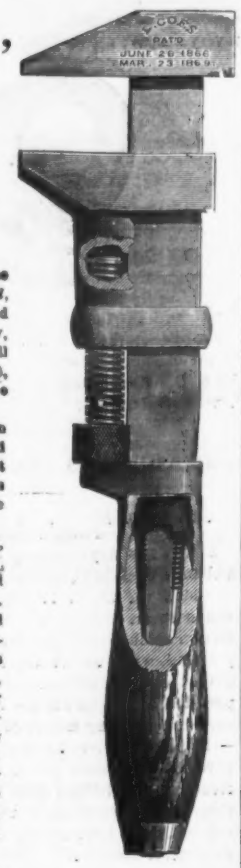
Established in 1839.

Registered March 21, 1874.

We invite the particular attention of the trade to our New Straight Bar Wrench, *widened*, full size of the larger part of the so called "reinforced or jog bar." Also our enlarged jaw, made with ribs on the inside, having a full bearing on the front of bar (see sectional view), making the jaw fully equal to *any* strain the bar may be subjected to.

These recent improvements in combination with the nut inside the ferrule firmly screwed up flush, against square, solid bearings (that cannot be forced out of place by use), verifies our claim that we are manufacturing the strongest Wrench in the market.

We would also call attention to the *fact*, that in 1869 we made several *important* improvements (secured by patents), on the old wrench previously manufactured by L. & A. G. Coes which were *at once closely* imitated and sold as the *Genuine* Wrench by certain parties who seem to rely upon *our* improvements to keep up their reputation as manufacturers, and although the fact of their imitating our goods may be *good* evidence that we manufacture a superior Wrench, we wish the trade *may not be deceived* on the question of *originality*. Trusting the trade will fully appreciate our *recent* efforts, both in improvements on the Wrench and in the adoption of a Trade Mark, we would caution them against imitations. None genuine unless stamped



"L. COES & CO."

Warehouse, 97 Chambers St., & 81 Reade Sts., N. Y.

HORACE DURRIE & CO., Sole Agents.

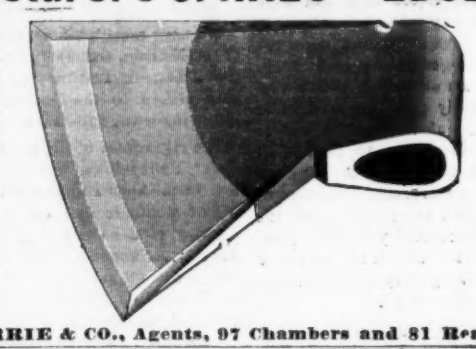
M. H. Jones. A. C. Peck.

M. H. JONES & CO.

COHOES, Albany Co., N. Y.

Manufacturers of AXES AND EDGE TOOLS.

All Goods Stamped and Labeled M. H. JONES & CO. unless otherwise ordered.



Sole right to the use of the TEN EYCK AXE MFG. CO.'S Trade Mark.

HORACE DURRIE & CO., Agents, 97 Chambers and 81 Reade Streets, N. Y.

TURNED

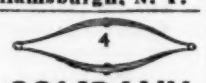
MACHINE SCREWS,

One-sixteenth to five-eighths diameter.
Heads and points to sample.
IRON, STEEL and BRASS.

Lyon & Fellows Mfg. Co.,

Cor. 1st and North 3d Streets, Williamsburgh, N. Y.

THE ORIGINAL

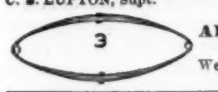


TOMLINSON SPRING & AXLE COMPANY,

ESTABLISHED 1852.

Manufacturers of FIRST CLASS SPRINGS AND AXLES. Also, THE GROOT'S PATENT CROSS SPRING.

RUSSELL TOMLINSON, Prest.
S. R. TOMLINSON Sec'y and Treas.
C. S. LUPTON, Supt.
} BRIDGEPORT, CONN.



All orders promptly executed.

We have no branch. Please send your orders direct.

CONCORD TRADE (CONCORD USE N.H.) MARK. AXLES

Will Run Easier, carry a Larger Load, and Wear Longer than any other Axle in the Market.

All GENUINE Concord Axles are stamped with above trade mark. Manufactured only by

D. ARTHUR BROWN & CO. Fisherville Concord N. H.

GEORGE T. RICHARDSON. FRANK H. SCUDDER.

Middleboro' Shovel Co.,

MANUFACTURERS OF

SHOVELS, SCOOPS & SPADES.

Office and Salesroom,

63 OLIVER STREET,

Works Middleboro, Mass. **BOSTON.**

J. CLARK WILSON & CO., New York Agents, 81 Beekman Street.

Philadelphia Star Bolt Works.

"STAR"

Carriage and Tire Bolts,

From the Best Brands of

NORWAY IRON.

Trade Mark.

The Celebrated

"STAR" Axle Clip.

All Styles of

FANCY HEAD BOLTS.

Blank Bolts, Skein Bolts, Square Head Bolts, Plow Bolts, &c., &c., &c.

TOWNSEND, WILSON & HUBBARD, 2301 Cherry St., Philadelphia, Pa

---

ESTABLISHED 1837.

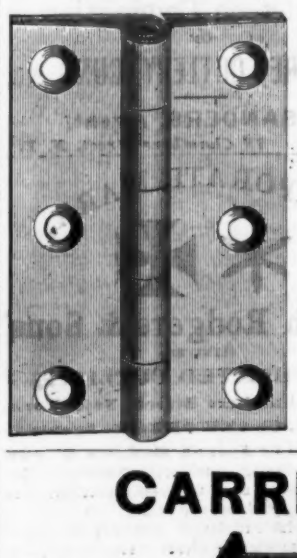
H. M. WENTWORTH & CO.

MANUFACTURERS OF

Carriage Springs & Axles

PAM, No 3 WATER ST., **Gardiner, Me.**

ALL GOODS WARRANTED.



Cast Brass Butt Hinges,

BRASS RIM AND MORTISE LOCKS,

Ice House Hinges & Fastenings.

Manufactured and for sale by

W. & J. TIEBOUT,

Manufacturers of

Brass, Galvanized and Ship Chandlery

HARDWARE.

290 Pearl Street, New York.

CARRIAGE BOLTS.

Buy the Best.

Clark's Patent Carriage Bolt.

Best Bolt manufactured for all kinds of agricultural machinery. Will not split the wood, and can not turn in its place.

MANUFACTURED BY

CLARK BROS. & CO., Milldale, Conn.

Also Manufacturers of

Plow and Machine Bolts, Coach Screws, Nuts, Washers, Tire Blanks, Rivets, &c

Send for Illustrated Price List.

HOOPES & TOWNSEND,

Manufacturers of

MACHINE & CAR BOLTS,

Cold Punched Square & Hexagon Nuts,

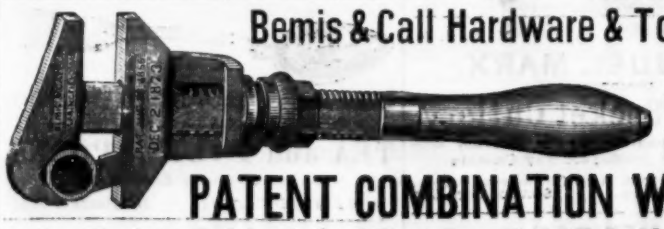
Washers, Rivets, Wood or Lag Screws, Chain Links, Truck and Car Forgings.

Bridge Bolts, Bridge Forgings.

IRONS AND RODS FOR BUILDINGS.

1330 Buttonwood Street. PHILADELPHIA.

Bemis & Call Hardware & Tool Co.



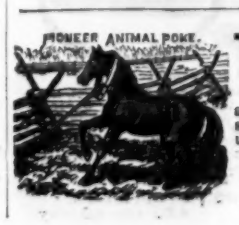
This Wrench can be furnished with Briggs' Pat. Nut or Sleeve.

PATENT COMBINATION WRENCH.

These Wrenches are made from the best of Wrought Iron, with Steel Head and Jaw, Case-Hardened throughout, and not only combine all of the superior qualities of our cylinder or Gas Pipe Wrenches, but also all requisite Combinations of a regular Nut Wrench, thus making a Combination which has no equal

For Circulars and Price List, address,

BEMIS & CALL HARDWARE & TOOL CO. Springfield, Mass



The Old Reliable Pioneer Poke.

The only Poke made with an oil tempered Cast Steel Spring. Our Pokes are manufactured under the personal supervision of the proprietors themselves, from the very best selected Oak and Hickory Timber, and finished in the very finest style. We warrant our goods to be first-class in every respect.

For further particulars and price please address

BISHOP & BENEDICT, Berea, Ohio.

SARGEANT MFG. CO.,

Manufacturers of

Saddlery Hardware

In Gold, Silver, Nickel, Japanned, Lined, & X C.

Sole Manufacturers and Patentees of various Patented Improvements, including Gig Trees, "Imitation Covered Mountings," Wedge Buckles, &c., &c.

75, 77 & 79 Summit St., NEWARK, N. J.

Clement & Hawkes Mfg. Co.,

Manufacturers of

SHOVELS,

Planters' Hoes, Trowels and Machinery.

Northampton, Mass.

Send for Circular and Price List.

The Cheapest and Best Gauge Cock made.

Baltimore Bell & Brass Works,

58 & 55 Holliday Street, Baltimore, Md.,

Manufacture all kinds of

Brass Work,

And keep on hand a full supply of all

Goods used by Plumber, Steam and Gas Fitters.

Brass, Iron, Steel and German Silver SCREWS.

FRANKLIN S. MILES, Manufacturer of

205 Quarry Street, Philadelphia.

C. DUCREUX, Agent,

Manufacturer of

SCREWS,

For any kind of work at prices lower than any furnished by his competitors.

93 Elizabeth Street, New York.

W. C. BOONE,

36, 38 and 30 Humboldt St., cor. Debevoise, Brooklyn, E. D., N. Y. Manufacturer of Standard

TURNED MACHINE SCREWS.

Case-Hardened Set, Cap and Gibb Screws, Hexagon, Collar, and Drilled Head Screws, Agraffes and Nose Bolts, Special Screws, Rivets, &c., made to order of Iron, Steel or Brass. Also Brass Knobs of all kinds made to order. Our Screws are made of the best Low Moor or Norway Iron, and are uniform in size.

The EUREKA "Perfected"

SELF-ADJUSTING

Simplest, Best and Cheapest Clothes Wringer in the World.

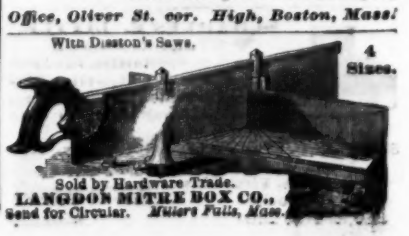
Steel Elliptic Springs.

T. J. ALEXANDER,

General Agent and Manager,

Office, Oliver St. cor. High, Boston, Mass.

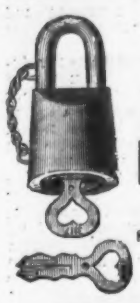
With Disston's Saws. 4 Sizes.



Sold by Hardware Trade.

LANGDON MITRE BOX CO.,

Send for Circular. *Millers Falls, Mass.*

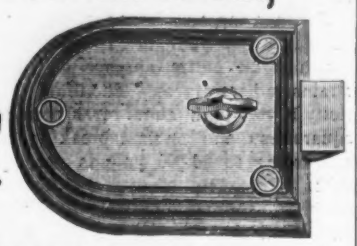


AMERICAN LOCK MFG. CO.,

Manufacturers of

FELTER'S

Locks & Latches,



Comprising

Store Door Locks, Night Latches, Drawer, Desk and Pad Locks,

All of which are furnished with

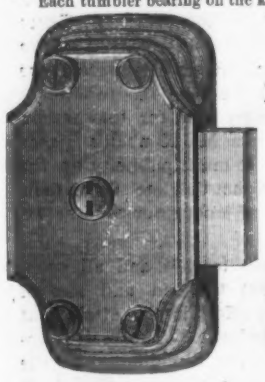
SMALL, FLAT, AMERICAN STERLING METAL KEYS,

Which are stronger than steel, ***and cannot be affected by rust,*** and will remain bright and clear under all ordinary circumstances.

A candid examination will convince the most unbelieving, that for simplicity, durability, convenience, and safety, they challenge comparison with any now before the public. Being made entirely by new and expensive machinery, especially constructed to manufacture them, ***they will rival the best made Locks in Finish and perfect operation.***

These Locks give perfect satisfaction, because they are the safest, cheapest and most durable Lock ever presented to the public, having ***thirty-five*** finely finished Brass Tumblers in each Door, and twenty-eight in each Drawer Lock, each one being finely false notched.

Each tumbler bearing on the key at two different points while locking or unlocking, without the aid of springs, which cannot be said of any other patent Tumbler Locks in use.



THE LOCKS ARE FITTED TO THE KEYS

And not the Keys to the Locks.

Hence Counterfeit Keys cannot be made.

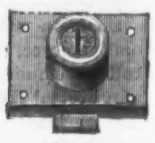
For descriptive list and terms, address

AMERICAN LOCK MFG. CO.,

OFFICE and WORKS, Cazenovia, N. Y.,

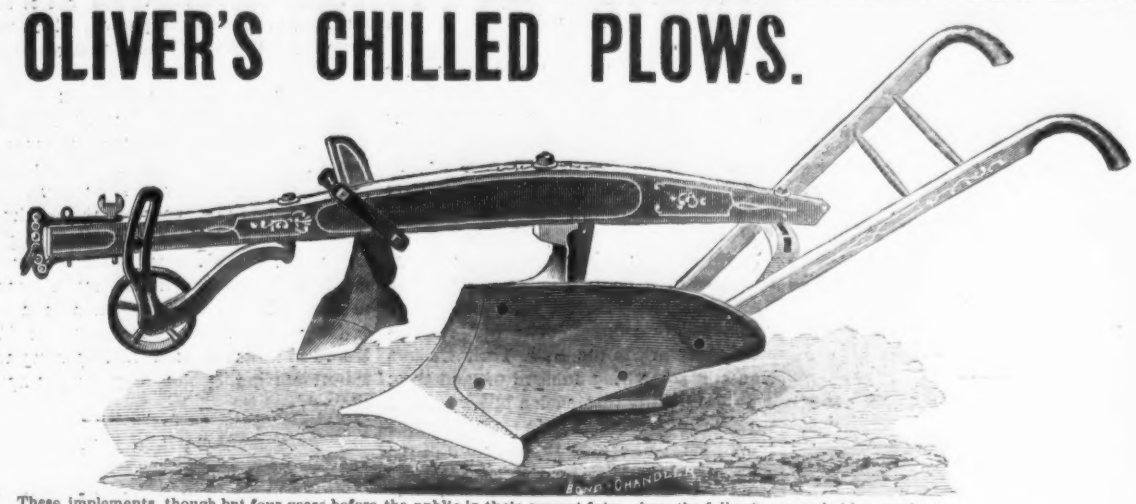
Or, **UNION NUT CO., Agents,**

78 Beekman Street, New York.



FULL SIZE OF KEY.

OLIVER'S CHILLED PLOWS.



These implements, though but four years before the public in their present form, show the following remarkable record:

1506 were sold in the season of **1871.** 7472 were sold in the season of **1873.** 31,077 were sold in the season of **1875.**
3049 " " **1872.** 14,976 " " " **1874.**

The sales for 1876, will undoubtedly exceed 60,000 Plows, one-third of that quantity being now on our order book. For full descriptive circulars, address

SOUTH BEND IRON WORKS, South Bend, Ind.

CLARK'S PATENT EXPANSIVE BITS

Made of JESSOP'S BEST CAST STEEL, and warranted superior to any other.

Two sizes: Large Size Boring, ⅜ to 3 inches; Small Size Boring, ⅛ to 1⅜ inches.

Manufactured by

WILLIAM A. CLARK, - - - Westville, Conn.

11 Warren Street, N. Y.

H. B. NEWHALL,

Agent for the Following Companies:

EMMET HAMMER CO.,

Manufacturers of all kinds of

Hammers and Sledges and Contractors' Tools.

H. B. NEWHALL, Agent.

All our goods are branded "E. F. EMMET & CO., Brooklyn, N. Y." None genuine without the above brand.

MACHINIST Ball, Straight and Cross Pene Hammers.
BLACKSMITH, Hand and Riveting Hammers.
" Sledges, Swages, Fullers, Flatters, hot and cold Chisels.
HORSE SHOERS' Turning and Shoeing Hammers, Sledges, Pincers.
MINERS' Striking and Drilling Hammers.
QUARRY Sledges, Macadamizing Hammers.
MASONS' Hammers, Brick Hammers.
BOILERMAKERS' Riveting and Flogging Hammers.
COOPERS' Hammers, Drivers and Stakes.
RAILROAD and **SHIP SPIKE** Mauls, &c., &c.

All kinds of

ANVIL TOOLS and STEEL FORGINGS

Made to order at short notice.

WM. H. HASKELL & CO.

Pawtucket, R. I.

Manufacturers of

COACH SCREWS (with Gimlet Point),

all kinds of

Machine and Plow Bolts,

FORGED SET SCREWS AND TAP BOLTS.

H. B. NEWHALL, Agent.

THE READING BOLT AND NUT WORKS.

J. H. Sternbergh, Reading, Pa.

Manufacturer of

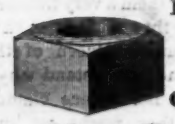
MACHINE BOLTS.

Bridge,

Roof,

and

Car Bolts.



Hot Pressed Nuts,

Washers, Wood or Lag Screws, Refined Bar Iron, &c.

H. B. NEWHALL, Agent, 11 Warren St., N. Y.
S. H. & F. Y. MOORE, Agents, 68 Lake St., Chicago, Ill.
POST & CO., Agents, Cincinnati, Ohio.

Penfield Block Works,

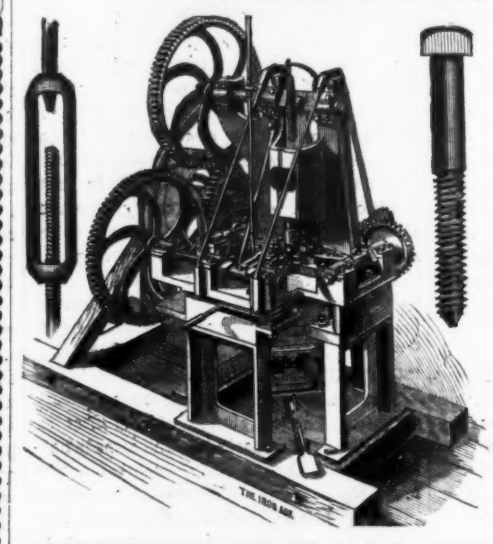
LOCKPORT, NEW YORK.

IMPROVED Iron Blocks.

Have edges of Shell turned out to save rope. *See Cut.* Polished grooves, and steel pins. When furnished with our Improved Steel Roller Bushed Sheaves, they stand unequaled. Send for Price List.

H. B. NEWHALL, Agent.

AMERICAN BOLT COMPANY,



MANUFACTURE

BOLTS AND NUTS,

Coach or Lag Screws, Washers, Chain Links, Forgings, &c.

OF ALL KINDS AND SIZES, AT SHORT NOTICE.

210 Lawrence St., Lowell, Mass.

JONATHAN HOPE. ROBERT H. BUTCHER. JAMES MINTER

With increased facilities we are now enabled to pay prompt attention to all orders for our **Patent Bolt Heading Machine,** now fully acknowledged the best ever invented. Our Machines will head Bolts from ¾ inch diameter to 1⅛ diameter, and from ½ inch to 48 inches long, or longer if necessary, and almost any description of heads—Square, Hexagon, T head, &c. and properly attended, without changing, will head from 3000 to 5000 per day. We are also prepared to offer for sale our **New Patent Bolt Cutter,** which will cut Bolts from ¾ inch diameter to 1¼ inclusive. A boy will cut on an average 4000 ¾ inch Bolts per day. Parties wishing first class Bolt Heading Machines or Bolt Cutters, we would respectfully invite to call at our works, where they can at all times see the Machines in operation and judge for themselves. Perfect satisfaction guaranteed in all cases. For references and any other information in regard to the above, apply to the **American Bolt Co., Lowell, Mass.**

G. W. LEONARD, 40 John St., Sole Agent for New York and vicinity.

H. B. NEWHALL,

Agent for
PROVIDENCE TOOL CO.
WM. H. HASKELL & CO.
LEWIS, OLIVER & PHILLIPS.
THE READING BOLT & NUT WORKS.
ADAMANTINE FILE WORKS.
PENFIELD BLOCK WORKS.
EMMET HAMMER CO.

WILSON BOHANNAN,

Manufacturer of Patent

BRASS

Pad Locks,

FOR

Railroad Switches, Freight Cars,

AND THE HARDWARE TRADE.

All sizes, with Brass and Steel Keys, with and without chains.

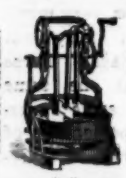
PASSENGER CAR LOCKS,

Bronzed, Nickel-Plated and Japanned.

BROOKLYN, N. Y.

Catalogues and Samples sent upon application.

Send for Circular.



DRAW CUT"

BUTCHERS' MACHINES

Choppers, Hand and Power.
Stuffers,
Lard Presses.

Warranted thoroughly made and the BEST IN USE.

MURRAY IRON WORKS
Burlington, Iowa.

First & Pryibil's

461 to 467 W. 40th St.
New York City.

Salesroom,
48 Cortland St., N. Y.

Patent Improved

BAND SAW MACHINES

For Bevel and Square Scroll Work and **Re-sawing.** Manufacture six different sizes. Prices, $165, $210, $260, $280, $425, and $1000. Also manufacture CARVING, SHAPING, FLUTING, ADJUSTABLE DOUBLE SPINDLE BORING, CARVED and SERPENTINE MOULDING MACHINES. Also, GENERAL and COUNTER-BALANCED OVAL TURNING LATHES for WOOD and BRASS TURNING, METAL SPINNING, etc.

CIRCULAR SAW BENCHES, SHAFTING, PULLEYS, and HANGERS. A large assortment of the best FRENCH BAND SAW BLADES, at greatly reduced prices. And a Machine that will set an ordinary Band Saw PERFECT in two and a half to three minutes. SAVING of LUMBER pays for the Machine in a very short time.

OHL & HAUSCHILD,

Engineers & Machinists

And manufacturers of

Lathes, Shapers, Slotters, Planers, Gear Cutters, Drill and Power Presses, Pulleys, Hangers and Shaftings, Machinery and Machinists' Tools in general.

57, 59 & 61 Passaic Avenue,
Kearney (East Newark), N. J.

Nuts, Bolts, Washers,

Etc.,

IN EVERY VARIETY.

Prices to suit the Times.

Send for Catalogue and Discount Sheet

TO

UNION NUT COMPANY,

78 Beekman Street, New York.

The Iron Age.

New York, Thursday, February 10, 1876.

DAVID WILLIAMS - *Publisher and Proprietor.*
JAMES C. BAYLES - *Editor.*
JOHN S. KING - - *Business Manager.*

RATES OF SUBSCRIPTION AND POSTAGE.

Weekly Edition.....$4·50 a year.
Issued every THURSDAY Morning. Contains full Trade Reports for the week, brought up to the close of business on the previous day.

Semi-Monthly Edition.....$2·30 a year.
Issued the FIRST AND THIRD THURSDAY of every month. Contains a full Review of the Trade for the previous half month.

Monthly Edition.....$1·15 a year.
Issued the FIRST THURSDAY of every month. Contains a full Review of the Trade for the previous month.

To Foreign Countries.

Including Postage.

To	Weekly.	Semi-Monthly.	Monthly.
Canada	$4 50	$2 30	$1 15
Cuba	5 04	2 52	1 26
Great Britain	6 08	3 04	1 52
France	7 12	3 56	1 78
Germany	6 08	3 04	1 52
Buenos Ayres	8 16	4 08	2 04
Peru	6 08	3 04	1 52
Belgium	6 08	3 04	1 52
Mexico	8 16	4 08	2 04
Sweden	6 08	3 04	1 52
New Zealand	8 16	4 08	2 04
Brazil	8 16	4 08	2 04

ADVERTISING.

One square (12 lines, one inch), one insertion, $2 50; one month, $7·50; three months, $15·00; six months $25·00; one year, $40·00; payable in advance.

DAVID WILLIAMS, Publisher,
10 Warren Street, New York.

WESTERN OFFICE.
14 Fifth Avenue, Cor. Market Street, Pittsburgh.
JOS. D. WEEKS, MANAGER.

PHILADELPHIA OFFICE.
220 South Fourth Street.
THOS. HOBSON, MANAGER.

EUROPEAN AGENCY.

CHARLES CHURCHILL & Co., American Merchants, 28 Wilson Street, Finsbury, London, England, will receive subscriptions (all postage prepaid by us) at the following prices in sterling: Great Britain and France, 25/; Germany, Prussia and Belgium, 33/4; Sweden, 50/. They will also accept orders for advertisements, for which they will give prices on application.

City Subscribers will confer a favor upon the Publisher, by reporting at this office any delinquency on the part of carriers in delivering *The Iron Age:* also, the loss of any papers for which the carriers are responsible. Our carriers are instructed to deliver papers only to persons authorized to receive them, and not to throw them in hall ways or upon stairs; and it is our desire and intention to enforce this rule in every instance.

CONTENTS.

First Page.—The Knowles Blowing Engine for Blast Furnaces. The Uses of Steel. Memorable Mechanical Notes.

Third Page.—A Man of Honor. Cheap English Iron Steamers. Improvements in Navigation.

Fifth Page.—New Patents.

Seventh Page.—Short Historical Sketch of Zinc.

Ninth Page.—English versus American Workmen. The Production of Iron in Prussia in 1874.

Eleventh Page.—Washburn's Improved Screw Blind Fast. Philadelphia Correspondence. The Centennial Programme of the American Institute of Mining Engineers.

Fourteenth Page.—The Prospects of Tariff Legislation. Some American Irons. Are the Hard Times Due to Over-Production?

Fifteenth Page—Exhibiting at the Centennial. The Superiority of American Iron Workmen. Scientific and Technical Notes. Co-operative Iron Manufacture in England.

Nineteenth Page.—Charcoal Steel Direct from the Ore.

Twentieth Page.—Some New Tools by Henry Disston & Sons. Steel Patent Steam Jet. The Manufacture of Zinc in St. Louis.

Twenty-first Page.—Trade Report.

Twenty-Second Page.—Trade Report.—(Concluded). Our English Letter.

Twenty-third Page.—Our English Letter.—(Concluded). The Properties of Malleable Cast Iron. The Swiss Exhibits at the Centennial. Phosphide of Copper.

Twenty-seventh Page.—The Iron Age Directory.

Thirtieth Page.—New York Wholesale Prices of Hardware and Metals

Thirty-first Page.—New York Wholesale Prices (concluded).

Thirty-fifth Page.—Philadelphia, Buffalo, Cincinnati, Pittsburgh and Detroit Hardware and Metal Prices.

Thirty-seventh Page.—Chicago, Boston, and St. Louis Hardware and Metal Prices.

The Prospects of Tariff Legislation.

In our issue of last week we gave an extract from the new tariff bill, (called Mr. Morrison's bill by courtesy), and promised to consider its provisions more fully when we had more space at command. We think it scarcely worth our while to keep this promise. Whether the bill be wise or foolish, there seems at this time not the remotest chance of its becoming a law, so it makes practically but little difference whether the changes which it proposes would be attended with good or bad results.

To make a radical change in the tariff is always attended with difficulty and delay. Had the new bill been prepared by the Committee of Ways and Means, and by Mr. Morrison reported to the House, its chances of becoming a law would have been very small at this time; as it is, the first battle over it must be fought in the committee room. The acceptance by the chairman of a ready made bill, drawn up by a gentleman with no other connection with the government than his employment as a clerk in the New York Custom House, is something unheard of, and there is no probability that such a bill would, in any case, meet the views of a majority of the committee. There are at least eight of the members of the Ways and Means Committee who have publicly stated their surprise at the action of Mr. Morrison in allowing a bill, drawn without consultation in committee, to be published in the newspapers and heralded to the country as a measure representing the views of the Democratic side of the House. The preparation of such a bill requires a vast amount of patient labor and investigation. No doubt Mr. Moore, its author, has studied the subject intelligently and for a long time, but the bill represents only his own conclusions, and there are without doubt a great many points upon which it would be impossible for the committee to agree with him. For this reason it is probable the bill will be voted down in committee. One reason for this belief is that the proposed tariff represents a complete and well balanced system of imposts for revenue. To change it in any material item would be to disturb the whole plan, and before it could be again made harmonious with itself, so many changes would be necessary that it would require remodeling throughout. In the present shape it must be accepted or rejected, and it is more than probable it will be rejected. If, however, it should secure the approval of a majority of the committee, its subsequent fate would be extremely uncertain. There is a strong and perhaps a controlling sentiment in the House opposed to any radical changes in the tariff at this time. If, however, it were passed by a party vote in the House as a party measure (of which there is no probability) it would still have to pass the severe ordeal of revision by the Senate. If it gets through the House at all, it will probably be pulled to pieces first. From the House it would go to the Finance Committee of the Senate which is so composed that the fact of its having passed the House as a party measure would help the bill but little. Any changes here made would have to be concurred in by the House, and consideration in conference committee would be necessary. When at last before the Senate, influences hostile to any important change at this time would probably mutilate it, if they did not defeat it, which they would be likely to do. It would then go back to the House for reconsideration, one or more conference committees would be necessary, and the report of these committees must be accepted by the House. When all this was done, and the bill was passed, it would still require the signature of the President to make it a law, unless it could be passed again over a veto—in case the President should not approve it.

In assuring our readers that the bill has not a ghost of a chance of becoming a law, in whole or in part, we speak advisedly. Admitting all the uncertainties of this years' legislation by Congress, we are in possession of definite information which warrants us in expressing a firm conviction that the Mooro-Morrison bill will never go beyond the committee-room. A canvass of the Committee shows an almost unanimous sentiment against any attempt at a thorough revision of the tariff this year, and a canvass of the House shows that it would be very roughly and unceremoniously handled, even if reported by the Committee. The opinion is very generally entertained and expressed by members of the House, that Mr. Morrison's ill considered action in the matter has been unwise in the extreme, and calculated to accomplish no other results than to create a general uneasinesss in manufacturing and commercial circles—exciting false hopes in some quarters, giving rise to unfounded fears in others, and, by unsettling confidence and creating uncertainty as regards the future, doing much to prolong the "hard times" from which we are now suffering, and to postpone the improvement so long expected and not yet in sight. It is important that these facts should be known and understood. Neither Mr. Morrison's bill nor one like it in any respect can this year become a law; and while the tendencies of tariff legislation seem to be in the direction of a reduction of duties and a gradual withdrawal of protection from domestic industries, no radical change can be made during this session.

There will, undoubtedly, be one or two tariff bills reported and passed, which will have for their object such changes as the interests of commerce may call for in rates of duty, in interpretations and in treasury regulations. We have something of this kind every year, and more or less of such legislation is imperatively necessary. More than this, however, cannot reasonably be expected, and we hope that the House will take occasion to give expression to its almost unanimous sentiment on this point at the earliest moment, to the end that the excitement and uneasiness which the publication of Mr. Moore's bill has caused in importing and manufacturing circles may be promptly allayed.

Some American Irons.

Before us are two pamphlets from the Globe Iron Works, Cincinnati, Ohio. The first of these contains information concerning two special brands of iron called "Globe Norway" and "Globe Refined." The manufacturers say that owing to an increased demand for a better quality of iron than the ordinary charcoal or boiled iron, they sometime since began to make these two grades of iron, which have proved equal to the foreign irons of this grade. At the Industrial Exposition, at Cincinnati, samples of this iron were tested upon one of Prof. Thurston's testing machines, and a lithographic *fac simile* of the strain diagrams accompanies the pamphlets. The inspection of these diagrams shows some very interesting facts in relation to these irons. We recognized the diagrams of these irons at once as being characteristic, having previously seen diagrams, taken by a friend, of some of these brands. The same peculiarities were retained in each case, showing that the iron was uniform in character, and that the machine was capable of recording this character correctly, the metal in fact, producing an autograph easily recognizable. These irons are designed to be soft, tough and exceedingly strong. In the latter respect it is intended that they should exceed the famous foreign brands of iron. Four samples were tested, "Globe Norway," "Globe Refined," "Globe Charcoal," "Globe Boiled." In general characteristics these irons are very similar. The toughness of the first is, however, very remarkable, the sample having twisted through 515° before fracture took place. The other samples twisted through from 280° to 340° before finally rupturing, the extension of the most stretched fibers being from 0·82 to 1·106 of their length. The limit of elasticity is very plainly marked in each of the irons, occurring in the first two samples after a twist of about 3½° and under a stress of 18,750 pounds per square inch. In the last two the amount of twist, when the limit of elasticity is reached, is 7° and the pressure per square inch 20,000 pounds. In all of these cases the limit of elasticity is high, and entitles these irons to rank among the best irons made in this country. The gradual rise in the line on the diagram, its regularity, together with the great angle through which the samples twisted, shows the metal to be of very good character. The highest tensile strength shown by any of these samples was 56,250 pounds, after twisting through about 390°, a most satisfactory result, and only 4000 pounds less than that which we obtained from a car axle iron which we tested sometime since. The axle iron was, however, much harder, and the amount of stretch was very much less, the angle of torsion being but 260° when rupture took place. Three other axle irons tested at the same time showed about the same average strength, and with a percentage of stretch which amounted to 0·73, or thereabouts. The stiffness and strength was very essential in the axle irons, while ductility was a property not so much needed. It is a curious point developed by the diagrams, that all these axle irons would have been much more stiff and possibly stronger had they been better worked. In some instances there were not only internal strains, but also a lack of perfect welding: in other words the irons seemed to have considerable seaminess. This was manifest from the low angle with which the lines of the strain diagrams started away, and also from its concavity, while the seaminess was manifest by a considerable droop in the line after the limit of elasticity had been passed. The strength of these irons is very great, ranging from somewhat below to a little above 60,000 pounds per square inch. We have seen diagrams from a special grade of iron which shows what can be done when makers can afford to put the work into the metal. The grade of iron of which we speak brings 16 cents per pound, and is probably one of the best qualities manufactured in this or any other country. The price is sufficient to repay the manufacturer and leave a fair profit, and the fact that it finds a market at this price shows that the labor and care bestowed upon the material produces a result that is valuable. The iron is much stiffer than those we have just mentioned; there is, on account of a more perfect working, an entire absence of internal strains and seaminess. The limit of elasticity is very high, about 24,000 pounds per square inch, and the final breaking strain amounting to 66,000 pounds per square inch. This metal is not as ductile as the Globe irons, breaking after a twist of 358°, and would, we should judge, be more difficult to work. Much working would injure rather than improve its quality, which is a serious defect in an iron for general use.

We now come to a very important question in connection with this subject, namely, the value of such irons regarded commercially and mechanically. We know that in structures where the greatest possible strength and least weight are needed, or in places where a perfectly trustworthy material is desired, irons similar to these which we have described are absolutely indespensable and must be obtained at any cost. Another question at once suggests itself: if these irons answer so well under the circumstances just named, will they not be frequently valuble under the more common circumstances where iron is used in construction? Let us see how these irons compare with the more common varieties. The common irons range in price from 2·4 to 3 cents per pound, and although many of them are tough, there is no small degree of uncertainty connected with them; consequently, they have to be made considerably larger than would otherwise be necessary. Thus in a rod in the side of a passenger car, half inch or even five-eighths iron is used. It has been found that when the finest double refined, or any other brand corresponding in uniformity and strength to those that we have mentioned, is used, the rod may be reduced with safety to three-eighths. Now while the fine irons cost double the price of merchant bar, ranging from 6 to 10 cents, yet the amount of iron used is so much less than that needed when a poorer quality is employed that the cost is the same or less, and the work is improved. In an extensive establishment near this city, the manager became impressed with the idea that it was desirable to employ a fine iron for bolts and similar iron work. The price paid per pound was just about double, but the quantity was less and the work stronger, while, at the same time, it was found that the bills for the iron were no larger than previously. If the best forms for iron work are found and good brands used, it is very probable that the total cost will not exceed that which would be necessary if the common grades are employed. The cases where this practice is especially desirable is in those situations where lightness and strength are both needed, as in a good deal of machine work, car building, engine work, many places on shipboard, and in almost any case where it is necessary that the work should be moved. Poor irons, while they often show an exceedingly high tensile strength, are not ductile; they break easily under sudden blows, and are unreliable, so that strong and light work is impossible with them. Good iron pays in its uniformity and the perfect security which results from a knowledge of the quality of the material which has been employed.

Are the Hard Times Due to Over-Production?

Ever since the panic the writers on politico-economic subjects have found congenial employment in accounting for it, and for the subsequent hard times. The favorite theory at this time seems to be that propounded by Mr. J. C. Kimball in the *Unitarian Review* for January and February, and which has furnished a text for a good many newspaper writers who have appropriated the idea and stated it as an original and startling discovery with a confidence which seems at least to indicate a belief in its correctness. The following extract from Mr. Kimball's article contains the complete idea in few words:

"It (hard times) is due simply to the introduction, during the last 25 years, of such an enormous amount of machinery. There is nothing in our modern civilization which is more wonderful, more significant, more a new thing under the sun, and destined to be more wide reaching in its relations, than this use of machinery. A single pegging machine will turn out more boots and shoes now than a whole village of cobblers at work in their little cubical shops fifty years ago. The cloth woven in any of our large mill towns is probably equal to half of what all the Indies used to produce by the slow hand methods of the Middle Ages. Steam engines alone are doing a work which without them would give employment to every one of the multitudes of men and women who are now lying idle in our country. California a few years ago was groaning over the introduction of so much 'Chinese cheap labor;' and yet, at that very time, most inconsistently, was giving a welcome to mowers and reapers and mining apparatus which, for cheapness and facility of use, made even a Chinaman dear. And then, when it is seen how these muscles and nerves of iron and steel are employed in every department of industry, from carving into shape a shaft of iron weighing 20 tons down to the finishing of a cambric needle, and from the sewing of a button-hole to the sowing and reaping of whole States, who can wonder that the market is over-stocked?

"Of course, this increase of facilities for doing work increased for awhile the amount of work to be done. But such a process could not go on forever. There was a limit even to the number of stitches which could be put into a lady's dress, and to the amount of wheat which even an American family could make way with. And this point has at last been reached. The occurrence of our civil war, with its enormous destruction of property, and its withdrawal of energies into the battle-field, put off the day; but the end of the war, and their return again into the pursuits of peace, soon filled up the gap, and brought us to the point where it was hardly possible to consume a half of what was being produced—the point, therefore, where business was obliged to stop."

We consider this a conspicuous example of a kind of literature only too common now-a-days, which inculcates pernicious errors, and does incalculable mischief by creating popular prejudices against the agencies which are mainly instrumental in promoting the world's progress. There is something plausible in the idea above presented, which insures its acceptance by those who never take the trouble to think, and probably it is for this reason that extracts from Mr. Kimball's paper have been given so much publicity by the newspapers, and that they are still on their errand of mischief among our country exchanges.

Common sense teaches, and all economists agree, that the end and aim of collective human effort is the attainment of universal abundance. The multiplication of labor saving machinery, and the consequent increase of production, is a step in this direction—but as yet only a step. The proportion of the people of even this favored country who have reached the condition in which they can say that all of their reasonable wants and desires are satisfied, and that they enjoy abundance, is certainly very small. With all the "overproduction" of which we hear so much, there are large classes of the community who never have known what it is to have had enough of food and clothing, and who can barely keep above the level of pauperism. With thousands clamoring for bread, and with our charitable institutions overcrowded with homeless poor who, but for the mildness of the winter, would have suffered with cold from November to May, it is simply idle to talk of an overproduction of breadstuffs and of textile fabrics. There is a limit to the want of every individual and every family, but in the case of a very large proportion of our population, that limit has not been reached, and would not be for generations, even with a production more active than the world has ever seen. Were it possible to effect such a distribution of the accumulated products of industry as would give every one what he needs to make him barely comfortable, it would be found that, instead of superabundance, there was not enough of anything to meet the immediate needs of our population. The coal operators of Pennsylvania tell us that there is an over-production of anthracite, and in order "to relieve the market" there is to be a long suspension of mining operations. Regarded from the standpoint which Mr. Kimball has taken, this is undoubtedly true; there is more coal in the market than can be sold at profitable prices, and the interests of the mining companies demand that operations shall be temporarily suspended. But we must remember that, in this city alone, there is a vast multitude who must content themselves with scanty food in order to obtain the coal with with which to cook it, and who would freeze in cold weather were it not for the cinders gathered from the ash bins of those who can afford to consume fuel wastefully. With so great a void yet to be filled with what we have come to regard as the necessities of life, those who speak of an "overproduction" of useful commodities—of a glutting of the markets with the products of the farm and factory and mine—must regard the subject from a standpoint which affords them a very limited range of vision, or else they must be as short-sighted as the unfortunate Queen of the French, who could not understand why the mob should besiege her palace clamoring for bread, when they might eat buns if they were hungry.

Obviously, the trouble which has brought about the industrial and commercial stagnation from which we are now suffering, owes its origin to something else than over-abundance. The natural answer to what we have said is that, owing to the substitution of machinery for hand labor, the world's work of production is carried on with so much less of the latter, in proportion to the amount produced, than formerly, that labor is cut off from its opportunity of exchanging its services for the means of satisfying its wants and desires. This is not true. The experience of centuries has shown two things: 1st. That while the use of machinery increases production, it also opens new fields for useful labor and, 2d. That as labor is largely and continuously a consumer as well as a pro-

ducer, the progress toward abundance must necessarily be slow, however active production may be. We have also learned from experience that the cheapening of the cost of manufactured products proportionately increases their consumption, by bringing them within the reach of a greater number of persons. Now, if the working classes were producers only, they might under some circumstances suffer temporarily from the introduction of machinery; but they are consumers as well, and share in the general benefits of a cheapening of the cost of the commodities they consume, to an extent which more than compensate them for such changes of occupation as the march of improvement may have rendered necessary. We have nothing to fear from labor saving machinery. To point to it as the cause of our financial and commercial troubles, indicates an ignorance as blind as that which impelled the French silk weavers to destroy the loom of Jacquard which, instead of taking away the work of a few hundreds of half starved, consumptive workmen, has given employment to a vast army of well fed, well clothed and comfortably housed operatives, and has added uncounted millions to the world's wealth. It is to labor saving machinery, and to the national inventive talent which has given it birth, that we owe pretty much all that we shall have to be proud of and to glory over as a nation on our approaching Centennial anniversary. It is to a still higher development and yet more general employment of labor saving machinery that we must look for such prosperity as we may hope to enjoy in the future. To say that we have reached the point beyond which a transferrence of the burdens of the world's work from human shoulders to arms of iron and fingers of steel, will be attended only with the misfortunes of over production and enforced idleness, is to state an absurdity.

If it is not from overproduction that we are suffering, what then? The question is easily asked, but it would tax the powers of as profound a student of social science as Herbert Spencer to answer it wisely in few words. Among the complex evils from which we suffer may be mentioned over-taxation. Too large a share of our labor goes to support costly systems of local, State and national government, and to repair the terrible waste of war. Another trouble has been, and still is, an overcrowding of the distributive industries and too costly machinery of distribution. Too large a share of the products of labor has been consumed in effecting the exchange of services between producer and consumer. A third cause of disaster has been a vitiated and inflated currency, with its attendant evils. To these we may add waste, improvidence, crime, indolence, intemperance, and go on extending the list until we had filled the page; but it is not our intention to push the analysis farther. Our only aim in writing at all has been to show that we have not yet reached the point of producing more than we need, and consequently that there is no such thing as over-production; also that labor is not idle because machinery has multiplied its productive capacity and lessened the value of its products. When we know what is not the matter with us, we shall be better able to arrive at a correct diagnosis of the disease which has paralyzed our energies and checked our progress toward a higher, truer, more comprehensive and, let us hope, more evenly developed civilization.

Exhibiting at the Centennial.

We are asked from time to time by the Rip Van Winkles of the various industries we represent, who have just waked up to the fact that we are to have a great Centennial Industrial Exhibition this year, how space can be secured. To such tardy inquiries we can only reply that the time for making applications for space closed in November of last year, and that those of our readers who did not take advantage of the fair warning we gave them, have only themselves to blame for having delayed application until too late.

There is another class of inquirers, however, to whom we have more to say. These are manufacturers who applied for space and got it, and are now hesitating whether to send exhibits or not. "Will it pay to exhibit at the Centennial?" is a question we are often asked by manufacturers, and as there are probably a good many debating the point who have not asked our advice in the matter, we will take this opportunity of publicly expressing our views on the subject.

In our opinion, it will pay any one to exhibit who has space at command and anything to show which he honestly considers worth showing. The shipment, care and return of goods will involve some expense, but if the exhibit be of interest, as showing the present development of any art or industry it should be shown, and those who have been alloted space should feel it a patriotic duty, as well as a privilege, to do what they can to make the exhibition a success and a credit to the American people.

Regarded from the purely selfish standpoint of self interest, it will pay to exhibit at the Centennial. The manufacturer who makes anything useful or beautiful, cannot bring his products too prominently to the public notice. It is to his interest that those who experience a want should know where and by whom that want can be supplied; and no opportunity was ever offered in this country, or will be again for many years, of attracting the notice of so large a share of the American public. As a people we will visit the exhibition by millions.

It is also of vast importance, as affecting the future of our productive industries, that the foreigners who visit our Exhibition should see what we are doing. The continued industrial development of the United States depends very largely upon the building up of our export trade in manufactures. Our products are already gaining a foothold in foreign markets, and the reports which foreign visitors carry home of our products and the state of our arts will, if the Centennial is a success, do much to encourage the establishment of more intimate relations with us than now exist. We consider that one of the greatest benefits resulting from our Centennial Exhibition will be the impetus it will give to our exports of manufactures to foreign countries. "What shall we show?" To this we reply, show the best classes of goods you actually make for sale. Articles made only for exhibition, and which have no practical utility, are of little interest. We may class them with glass steam engines, silver plated stoves, ten thousand dollar mowing machines, &c. Such articles are only useful, if shown, in attracting attention to the substantial and practical exhibits beside them, and should be made secondary to those which represent the actual state of the art. The manufacturer who spends his money in elaborate and inappropriate ornamentation which adds nothing to the utility and value of the article he exhibits, will waste it and his time. Reducing our views to few words, we would say to those who have space in the Centennial:

1. Occupy it, by all means.
2. Show the best articles, or classes of articles, you make for market.
3. Make your exhibit attractive, but let ornamentation be subordinate to utility.
4. Do not make too much of an effort to advertise yourself. "Good wine needs no bush," and a good article of any kind commends itself.
5. Do not be afraid that competitors, domestic or foreign, will steal your patterns, your ideas or your trade secrets. If they want to do so, you cannot hinder them by not exhibiting. You will learn as much from the exhibits of others as they can learn from yours.
6. Compete honestly and fairly for honors. If you get them, well and good; if not, find out why other goods are better than yours, and profit by the knowledge you may gain.

The Superiority of American Iron Workmen.

The inefficiency of foreign iron workers, as compared with American, has long been a subject of remark, not only in this country, but in England as well. It is indisputable that in all the operations about a rolling mill the average output per man is much greater in this country than in England, which is the one comparable with us. A sheet roller, for example, with a less number of men, will turn out from 10 to 25 per cent. more per day than his English fellow.

Now this statement is not born of national pride or prejudice, but is freely conceded by the English. We have before us a copy of the London *Times* of January 16th, which, speaking on this very subject of the greater efficiency of American iron workmen, says:

> This is especially true of heavy manufacturing work, such as machine or engineering work and the fabrication of hardware, cutlery and other manufactures of iron and steel. In all these branches 900 Americans are thought to be equal to 1000 Englishmen in the amount of work per week they will accomplish. This corresponds with the experience of our own manufacturers. It has before been observed here that in labors demanding enormous physical strength and endurance, like iron puddling, the Americans were superior to the English; while in patient, steady drudgery the British "navvy" or Irish day laborer is much beyond the Yankee. And Mr. Brassey's experience is, no doubt, true, that the English day laborer is the cheapest laborer in the world, because he accomplishes the most for the money. The American demands a toil with some peculiar stimulus to call out his best powers. Thus in a dangerous and difficult employment like lumbering, demanding great strength and presence of mind, no nationality is equal to the American.

The reason given for this by the *Times* is not sufficient. English workmen can have the stimulus of labor above that of digging ditches, but there is a stimulus that very few are urged by in England but are in this country, and that is of owning land, of rising above their condition, or, at least, making it possible for their children to do so. This makes our workmen willing to labor harder—"to "work on the jump."

But there are other reasons. One, doubtless, is that in the past there has been such an overstock of workmen in England, that in order to give them all employment the unions have decreed how much shall constitute a day's work, and this same reason will explain the greater and useless division of labor. There is a story current in Pittsburgh that an Englishman fresh from home sought employment as a sheet roller and got it. To his utter suprise he found that there was no place about the rolls in an American sheet mill the equivalent of the position he occupied in England, where his sole employment was the using of the gauge in the run.

But on this point it may not be amiss to quote the *Times* again:

> The explanation given of the greater efficiency of American labor is probably the true one—that it lies in its greater "adaptability" owing to the superior education and intelligence of the American factory workman, and in the more temperate American social habits. The English workman requires a day or two to get over his Saturday night and Sunday drinking sprees. The extent to which the English laboring class drink up their wages appears in a melancholy form in this report. [Dr. Young on Labor]. The consul at Sheffield reports that great numbers of working men stop work on Saturday noon, and do not commence again till the following Wednesday. This is, in part, because they need Monday and Tuesday to enable them to recover from the effects of Sunday's drinking. "Increase of pay," says the Consul at Birmingham, "means increase of drink." In Manchester our Consul reports that many sober workingwomen complained that increased wages and shortened hours of labor were a curse to the families, as the men were only the more tempted to drink. In Liverpool there seems a widespread and fearful demoralization of the laboring class from their intemperate habits. And thus from almost all the manufacturing centers our officials report a wretched condition of workingmen's families and reduced efficiency of labor from the habits of intemperance prevalent.

It is St. Monday that is destroying the efficiency of English workmen, and we earnestly hope that he may never have a place on the calendar of the American workman's saints.

The report of the legislative committee appointed to investigate the affairs of the Philadelphia & Reading Railroad, has been prepared and will shortly be presented to the Pennsylvania Legislature. The following is given out as a synopsis of the document: The committee find that the companies have not been violating their charters, as charged in the preamble of the resolution; that the constitutionality of the act incorporating the Philadelphia & Reading Coal and Iron Company is a question for the courts, and not for the committee to decide, and they submit the whole of the evidence to the Attorney General, to take such steps in the premises as the facts may justify. They also find that a combination was entered into by the six carrying and producing companies, but that the combination was not a conspiracy obnoxious to the law, and declare that the effect of the combination was to reduce the price of coal. If any one expected any different report from this, he must have had a very unusual degree of faith in human nature. All the report we are likely to get could have been written as well before as after the investigation. A corporation like the Philadelphia & Reading Railroad can do no wrong, and it is a waste of time and money to investigate its management, plans or purposes.

It is well to be good natured, even about our misfortunes. A Massachusetts newspaper admits the correctness of the statement that "ten mills make one cent," but assures its readers that the rule does not apply to any ten mills in that part of the country. We have no doubt there is an uncomfortable amount of truth underlying this bit of pleasantry.

Scientific and Technical Notes.

Dr. Klein, in reference to the use of

DAILY WEATHER REPORTS,

states that in Europe, as in America, in all cases, the reports of the weather westward of a given station are of the greatest importance, while reports from stations to the east are, on the average, of minor importance in making weather predictions. A southerly wind in the region of Ireland, Scotland or Norway indicates the approaching side of an area of low barometer. It is, therefore, a sign of a coming change in the weather. A northerly wind in those regions indicates, for Germany, that the pressure of the air from the ocean is high, and can be considered as a sign of steady, pleasant weather. Irregular changes of atmospheric pressure and of the winds are extremely slight in Eastern Asia, and the cold of winter, when once commenced, continues uninterruptedly in Eastern Siberia, with a permanent high barometer. The reason of this is found in the existence of the great mountain chains of Asia. The region of high barometer is generally separated from oceans and from equatorial regions by these lofty chains of mountains. The coldest and densest stratum of air can, therefore, not flow away toward the sea. Its only escape is found at points like Jakutsk, where it passes over land 3000 feet above the ocean. Thus, throughout the whole interior of Asia, the lower stratum of air remains quite cold and heavy until the summer sun, heating the surface of the earth, stirs up the atmosphere, very much as water boils in a vessel over the fire. That which takes place in Asia is repeated in a much less intense degree in America. The area of greatest cold on this continent is not prevented by any range of mountains from extending southward and eastward, but is only hemmed in on the west by the Rocky Mountains. Thus, while the Pacific coast is protected from an overflow of very cold air, the whole eastern portion of America becomes peculiarly subject to it.

A new process for

PRESERVING WOOD

from fire and decay has been invented by Messrs. Weatherby & Moore. It consists first in kiln-drying the wood, which deprives it of all moisture and much of its volatile turpentine and other inflammable matters. It is then put into suitable cylinders, in which lime and water, with sulphurous acid gas, are forced into the pores of the wood under considerable pressure. The wood is removed, dried, and is then ready for use. The chemistry of the process consists in the formation of a soluble sulphate of lime by means of the sulphurous acid and the lime; this crystallizes as a bisulphite, which oxidizes and is converted into the sulphate of lime or gypsum. As this is an exceedingly insoluble salt, it is not easily removed from the pores of the wood, and not only by its presence protects it as a non-conductor of heat, but deoxidizes all matters which are likely to prove objectionable as ferments.

Co-operative Iron Manufacture in England.

The London *Times* says: The British workman of modern days is a singular product of civilized social activity. Without adopting either the extreme optimist or the extreme pessimist view of his character, we must admit that he has many rare excellencies and many disagreeable faults which are peculiarly his own. If he is not the paragon of practical sagacity, of intellectual capability, and of moral composure that some advocates of an extended suffrage painted him nine or ten years ago, he is still less the thriftless sot, the greedy and fanatic enemy of property and order, whom the Tories of that time represented to themselves and to the country. The artisan in modern England is acute, though suspectible of strange, almost incredible beguilements; he is patient, energetic, and capable of continuous exertion in a greater degree than the handicraftsman of any other nation, yet he has perplexing fits of langor or recklessness; he is industrious, but at the same time self-indulgent; above all, though he is frank and direct in his habit of thought, he obeys with perfect discipline the orders of organizations whose policy never rises above the level of suspicion. Out of these anamolies arise the complicated problems of the English labor question. We have not a simple state of war to do deal with, such as foreign economists describe, in which the workmen declare that no peace—no truce, even—is possible with the abominable and all-devouring monster, capital. But our difficulties are less calculable because they are generally less threatening. Masters and men may be on the best of terms for years, but suddenly some powerful union gives the word of command, discloses its suspicion that the employers are absorbing an unfair proportion of the profits of business, demands an increase of wages that would reduce trading to a loss, and, this demand being refused, plans a strike or provokes a lock-out. Every campaign of this sort produces a contagious chafing of spirit; masters and men are alike Englishmen; they get their back up easily, and when their neighbors have come to blows it is hard for the spectators to keep the peace. The pretext, however, is always the same; either the masters protest that profits have declined, and that a reduction of wages must follow, or the men allege that profits have augmented, and that an increase of wages is reasonable. The state of business is always accepted on both sides as the test and justification of every claim for a modification of terms. But the men, in ordinary circumstances, do not and cannot know anything about the real facts of business; they look with distrust on the statements of the masters as the unsupported assertions of interested parties; they devour with credulity the assertions of unionist leaders who tell them of swollen profits, as all men are want to swallow promises of larger share in the returns from their daily toils.

It is hardly possible, however, to conceive an industrial organization in which all workmen, content with their position as wage earners, could be fully informed as to the course of business and the fluctuations of profit and loss. There is no record of experience, nor any process of economical reasoning, to convince us that any large number of manufacturing enterprises can be conducted upon what are known as "co-operative principles." Here and there such enterprises have been attempted, and will be more frequently attempted, sometimes successfully, more often unsuccessfully; but whether successful or not, they do, incidentally, a great service to the entire community. They are, however, essentially exceptional undertakings; they demand exceptional qualities both in the managers, the providers of capital, and the humbler workers, which capital is their labor. The investors of money in these co-operative enterprises must submit to a publicity from which ordinary speculators in manufacturing business would shrink as ruinous. The principal holders of capital must reveal and prove by an exact balance sheet every casual change of profit and loss; the managers have to submit to the criticism, frequently ignorant and splenetic, of the artisan partners in the concern.

These conditions are not favorable, it need hardly be said, to commercial success; with ordinary capitalists, managers, and workmen, they would render success a sheer impossibility. Even when there is exceptional self-sacrifice on the part of the investors, exceptional patience on the part of the managers, exceptional intelligence and providence on the part of the workers, to expect that those qualities should become universal in English manufacturing industry would be the most Utopian of dreams. But, were they universal, it is not clear that they would ensure success for the co-operative movement. We printed recently an interesting summary of the half yearly report of one of the most prosperous co-operative manufacturing enterprises in this country. The North of England Industrial Iron and Coal Company has "blast furnaces and rotary puddling furnaces at Carlton, near Stockton; coal mines at East Howle, in the county of Durham, and ironstone mines at Ailesbury, in Cleveland." It ought not, perhaps, to be called, in strictness, a co-operative association, being organized as an ordinary limited liability company; but several of the co-operative societies which have multiplied and prospered in the North have acquired large shares in the business, and it may be regarded as an enterprise in which the working men have a direct proprietary interest. Does their experience as proprietors justify the extravagant demands on which so many of the recent strikes in the iron trade were founded? On the contrary, the directors "regret being unable to report any improvement in the general condition of the iron and coal trades during the past six months." "The impossibility," they add, of realizing remunerative prices for malleable iron in the present state of trade has led them to a temporary suspension of operations at the forge in Carlton Iron Works." Like any ordinary masters, they have confidence in the ultimate success of the system they have adopted; they are proud of a "small profit" from the blast furnaces; they deplore the sacrifice of capital by the abandonment o some iron stone mines in Cleveland, but are satisfied that "more serious and continuous loss" has been thereby avoided; and finally, while regretting that "the present precarious state of trade will not allow them to recommend an interim dividend on preference shares," they express a confident belief "the extreme limit of the depression has now been reached, and look forward hopefully to a revival of trade in the spring, which will essentially improve the position of the company and justify a resumption of work under favorable conditions."

These roseate confidences, conjoined with such gloomy disclosures of facts, will be carried home to the minds of the working people of the North through the co-operative societies which hold shares in the company. Many workmen, probably who have clamored against the owners of iron factories, ironstone mines and collieries, and who have pressed unceasingly for an increase of wages on the assumption that profits were constantly and certainly increasing, will now be forced to admit that losses have sometimes to be borne even when they are not openly confessed. The co-operative societies have to submit to a blank return of interest upon their investments; and their supporters may now understand that often, when an advance of wages was demanded, or a reduction contested, the masters, though not having the courage to make as frank a confession of commercial misfortune as the directors of the North of England Industrial Iron and Coal Company, were fully justified in declining to pay in hard cash a share of imaginary income. The barrenness of the present time may also suggest to the workingmen that the position of a wage-earning laborer has its advantages as well as its disadvantages. If the workman for a weekly wage has no means of exacting with precision a share in the profits rising with the improvement of trade, he is protected, except in extreme cases, against the risks of loss by the stagnation of trade. He has a certainty of the same employment on the same terms so long as business can be carried on at all; his employers accept all the hazards, and expect to be proportionately remunerated. The working man in an industrial undertaking is very nearly in the same position as a debenture holder in a company. His wages are the first charge, and their rate is fixed, except by a variation of the contract mutually agreed upon. The risks fall upon the ordinary share holders—that is, upon the capitalist employers. It is not reasonable that the debenture holder, while retaining the security of his 4 or 5 per cent., should claim to participate in the gains of the ordinary shareholders in the profitable years, and should repudiate responsibility for losses in the unprofitable years. The co-operative societies which have become part owners in industrial undertakings will teach the working classes a valuable lesson, by impressing upon them, as the result of their experience, that responsibility for trade losses must always accompany a right to share in trade profits. For this complicated relation only a small majority of English workingmen will be fitted or inclined for many a year to come. Meantime, the hard truths which the co-operative investors in the iron industry have been obliged to digest ought to furnish matter for meditation to all those who would rashly provoke conflicts between employers and employed. The argument of those who justify strikes is that the masters are taking too large a share of the gains of business, and are giving the men too small a share; but is it likely that the experience above disclosed is altogether exceptional, and that capitalist employers, as well as co-operative companies, have not to fight their way, paying for labor all the time at a steady rate, through long periods of continuous loss.

H. D. SMITH & CO.,

Plantsville, Conn.,

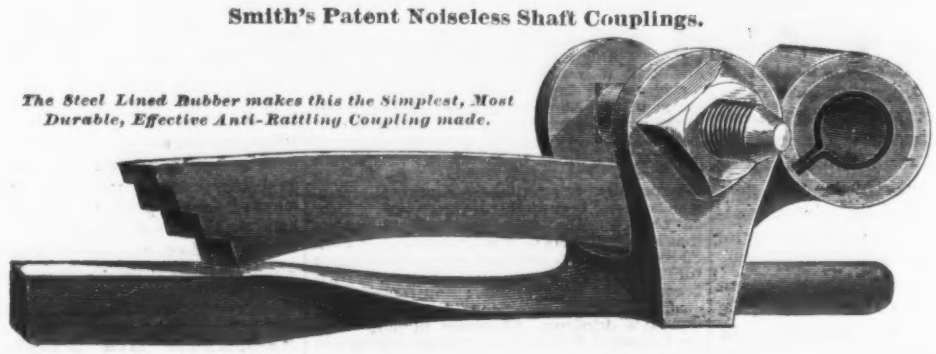
Manufacturers of the

BEST QUALITY CARRIAGE MAKERS' HARDWARE.

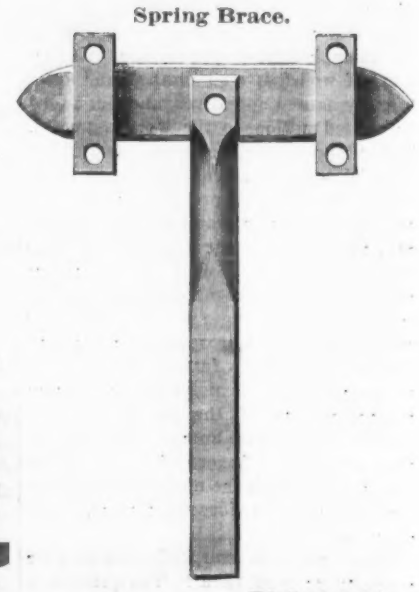
Patent Whiffletree Bolt, Bent Pattern.

Smith's Patent Noiseless Shaft Couplings.

The Steel Lined Rubber makes this the Simplest, Most Durable, Effective Anti-Rattling Coupling made.

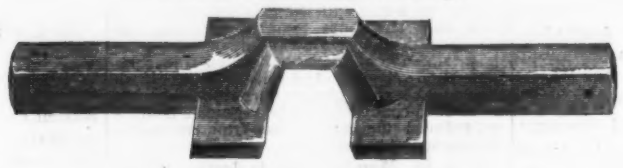


Spring Brace.

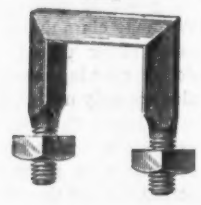


Felloe Plate.

Patent French Coach Clip.

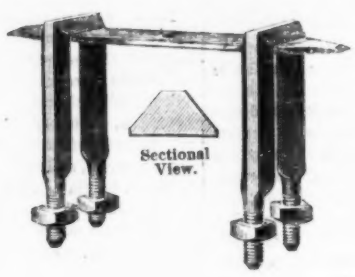


Short Spring Clip.



New York Slat Irons.

Saddle Clip, Octagon Pattern.

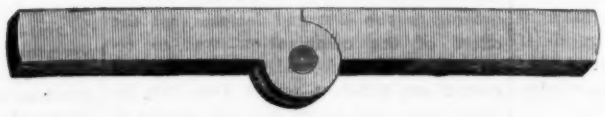


Plain Pattern Axle Clip.

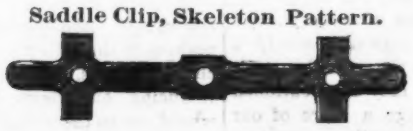
"The Anvil" Axle Clip.

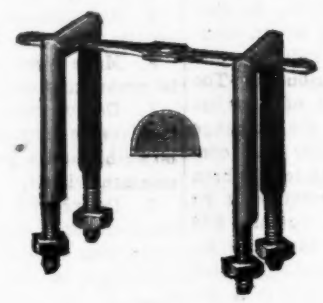
Spring Bar Clip.—Smith's Pattern.

Smith's Milled Stump Joint.

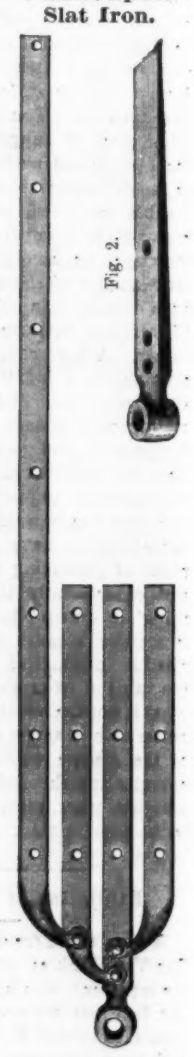


Saddle Clip, Skeleton Pattern.





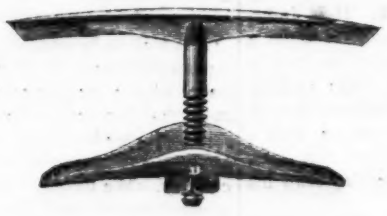
Philadelphia Slat Iron.



Clip King Bolts.

Improved Shaft Bolts.

Felloe Holders.

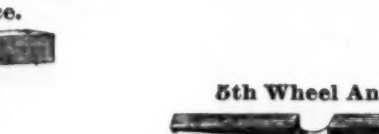


Axle Saddle Clip.

Coach Axle Clip.

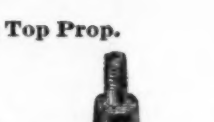
Brewster & Co. Patent Whiff Plate.

Loop Yoke.

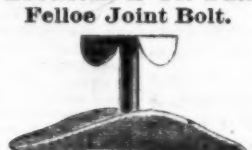


Axle Clip Yoke.

Safety Loop.



Brewster & Co. Pat. Felloe Joint Bolt.

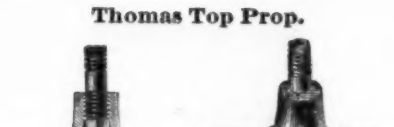


Cross Bar Step.

King Bolt Yoke and Brace.

5th Wheel Anti-Rattler.

Thomas Top Prop.



Manufacture the Largest Variety of Forged Carriage Irons of Best Material and Workmanship.

PRICES LOW FOR QUALITY OF WORK FURNISHED

SEND FOR PRICE LIST.

Two Direct Cutting Edges instead of One Scraping Point.

$1000 Challenge that the Lightning Saw is the Fastest Cutting Saw in the World. It will do more work, day in and day out, and I will back it against any responsible manufacturer.

BEWARE.

N. B.—Some Northern Jobbing Houses, in the interest of infringers, are selling old damaged goods at less than they can repla ce them.

E. M. BOYNTON,

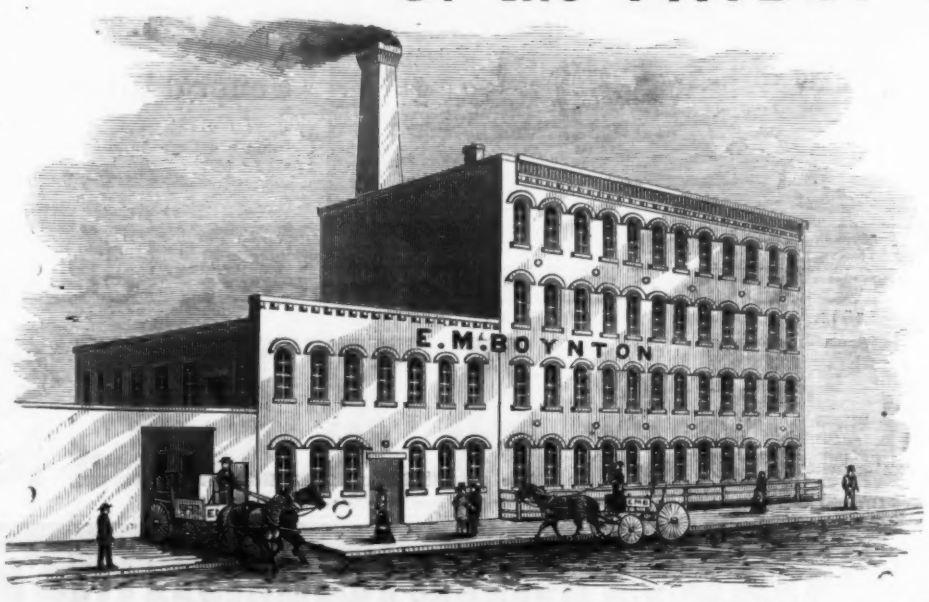
80 Beekman Street, New York.

Manufacturer of all Kinds of

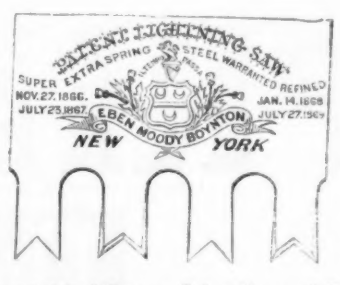
First-Class SAWS.

Also, SAW FRAMES, PATENT CROSS-CUT HANDLES, SAW SETS, FILES, and Sole Proprietor

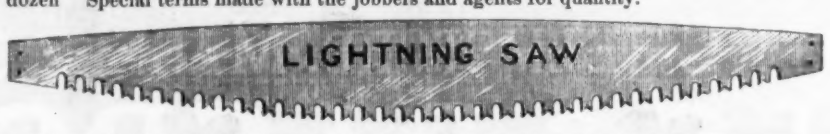
Of the PATENT LIGHTNING SAW.



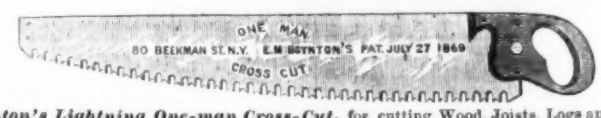
Exact size and shape of Lightning Teeth for the Centennial year, to be illustrated at Philadelphia, Pa., by E. M. Boynton.



The attention of the trade is especially invited to the vindication of my Patent Saws as shown by the published Decree, Injunction and Costs of U. S Court, of September 2d, 1875. In the mean time the other varieties of Clearing Teeth Saws have been overthrown and pronounced invalid. My Patent **M** Teeth alone stand as the only vindicated and protected Patent for Cross-Cut and Buck Saw Teeth. I shall proceed at my leisure to make it interesting to infringers, having retained Gen'l Butler and other excellent counsel. ☞ My advice to the trade is to cease selling counterfeits of my goods. I will make any of these imitation goods at prices as low as they can be made, of good material and workmanship, while I will furnish the genuine Patent Lightning Saw at 50c. per foot by the dozen Special terms made with the jobbers and agents for quantity.



Boynton's Patent Lightning Cross-Cut Saw. Price 50c. per foot, Set and Sharpened.



E. M. Boynton's Lightning One-man Cross-Cut, for cutting Wood, Joists, Logs and Timber, and sawing down trees, to which can be attached one of my Patent Adustable Handles, removable at pleasure. Complete, ready for use. ***Price, 60c. per foot.*** Sizes, 3, 3½, 4, 4½, 5, 5½ and 6 feet. Millions of Axes are in use, where, by using this Saw, half the time would be saved, and no waste of fuel occur.

Frame made of best seasoned stock, and warranted the stiffest adjustable braced frame in the market. Gives universal satisfaction. (30 inch) complete, with Lightning Blades, $8·50 per doz. 100,000 sold and cannot get enough of them made *perfectly* at my own manufactory.

This cut represents the use of my special files, made to fit the angle of the teeth, dressing both points at a single blow, making the saw the simplest and cheapest to file in the world. The shortening of the tooth the thickness of a sheet of paper (which is all any single tooth penetrates) leaves but little dressing necessary. For the undulled edges of the outside of M, the third surface of the file is all that will be needed. They are made 2d cut of highest quality. By the use of this file all difficulty is removed, and the cost of filing Lightning Cross-cut Saws at the factory is two cents per foot; buck saws four cents each. The cost of the 10 inch for cross-cuts is $4·20, net, per dozen; 5 inch, for buck saws, half price. A large stock kept constantly at my store in Beekman street.

10 INCHES LONG.

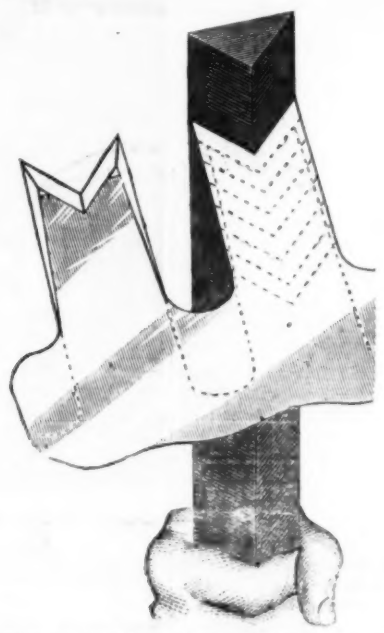
BOYNTON'S PATENT SAW-SET.

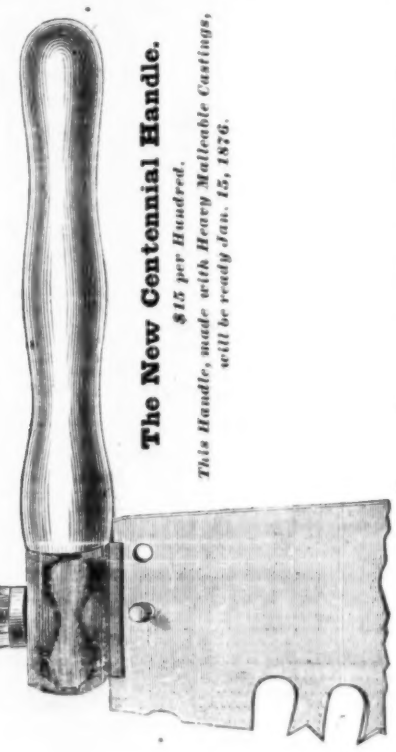
PATENTED NOVEMBER 25, 1873.

Best cross-cut saw-set in the market. A blind man can use it. Sets any kind of a cross-cut saw. Always ready for use; adjusted by a single thumb screw. Can set a saw in field or forest, without any other tools, as well as in a saw shop. No prying, wrenching or hammering in setting, like most other saw-sets.

DIRECTIONS FOR USING.—Simply hold saw in left hand, and then place set on saw tooth, as represented in cut, so as to rest on the gauge, then with right hand bring handles of set together, and the tooth is set. If more set is required, draw gauge back so set can take a deeper hold of tooth. It will also set my Lightning Buck Saw Blades, both points of teeth at once. It has only to be used to be appreciated.

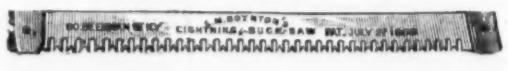
Price, per dozen, $8·40 net; sample sent by mail to dealers on receipt of $1·00.

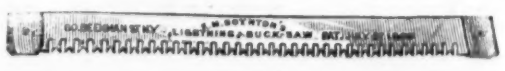


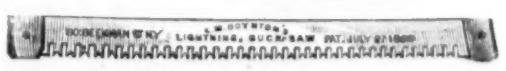


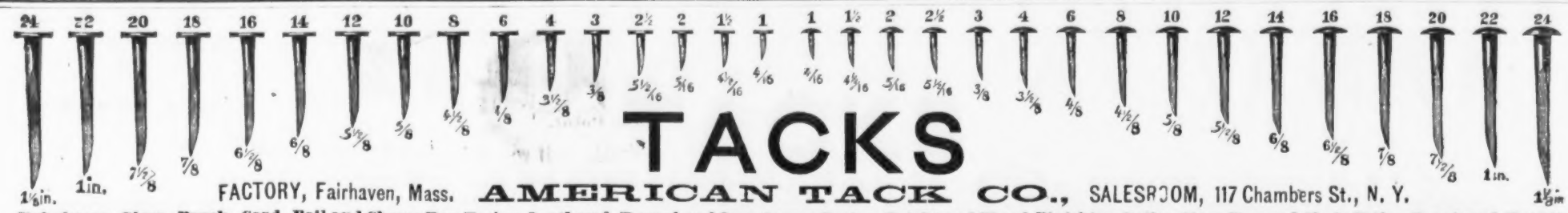
My genuine Patent Lightning Saws still lead the American market, and are shipped abroad extensively. No manufacturer dares question this or submit his saws to a public test trial. I offer $500 for expenses. My efforts within a few years have trebled the sale of Cross-Cut Saws. While I have prospered, the public have been educated in scientific timber cutting—no small thing when it is asserted that a Billion Dollars is the annual Wood, Lumber and Timber crop of America—four times the value of our wheat crop. The immense waste in cutting wood with axes is almost incredible; any one engaged in cutting cord wood will tell you that the tough and knotty timber and chips are wasted, when they may become good stove wood, if the logs are cut short with my cross-cuts, as blocks of one foot in length are *easily hauled and split.* The savings of timber and time by the scientific use of saws, it is computed, would equal the annual interest on the U. S. public debt *saved*, and the toil of millions of farmers be lightened, if they will only learn to use saws. Every clearing tooth saw has no other *cutting* teeth but the old **V**, and is, therefore, necessarily inferior. It has, however, an **M** shape clearer, and if the speed is due to one **M** in three teeth, why not treble the improvement by using all **M** teeth? A Champion Raker **M** does no *cutting*, but to prevent its clearers catching, it is kept 1-16 inch short, six average *cuts* of 1-100 inch short, and therefore its only mission is to remove dust that may be choking up the arches. As a shovel it is useful; but my Lightning plow teeth, *all of even length*, require no shorting or gauge, clear as they cut simultaneously, which is better than the old process of wearing off timber. *This* is why *no* manufacturer *ever has dared* test publicly against my Lightning Saw, which was awarded the highest *Silver Medal over all competitors* at last American Institute Fair, the same as usual.

The teeth of an ordinary cross-cut saw are usually one inch dust space. If an ordinary log saw has fifty teeth employed in cutting a log, and if a progress of ¼ inch each motion is obtained, the cutting of each point would be 1-50 of ¼ inch, or 1-200 of an inch, the thickness of a very thin sheet of paper. If we allow a cut of double the amount, still but a hundredth of an inch is used. Now, by filing out the middle of my tooth, thus **M** it is evident the shortening of an average filing will reach up to the undulled edge, which will require but slight edging, thus saving the shape perfectly, and *economizing a square inch instead of the point of steel of other saws, or thrice the durability, without gumming, thus saving time and money.*









TACKS

FACTORY, Fairhaven, Mass. **AMERICAN TACK CO.,** SALESROOM, 117 Chambers St., N. Y.

Upholstery, Gimp, Brush, Card, Pail and Cheese Box Tacks; Leathered, Tinned and Iron Carpet Tacks; Bright and Blued Finishing Nails; Cigar Box and Chair Nails; Trunk and Clout Nails; Brads, Patent Brads, Copper Tacks and Nails; Iron, Zinc, Steel and Copper Shoe Nails; Polished 2d and 3d Fine Nails; Roofing and Slating Nails; Roofing Tacks, Tinned Tacks and Nails of every variety. Any size or style of Tack or Nail made to sample. Orders sent to either Factory or Salesroom will receive prompt attention.

Sheffield Trade with the United States.

Under this heading and that of "Startling Statistics," the Sheffield *Daily Telegraph* of Jan. 11th published the following particulars, which supplement those given by our Sheffield correspondent last week, which we give as being of no little interest to the American iron trade:

We give below a series of statistics, obtained through the courtesy of Dr. Webster, from the official records of the Sheffield Consulate. These figures tell their own tale, and we leave them to the serious consideration both of employers and employed. It will be noticed by the general reader that one leading branch of our local trade with the States—the Bessemer steel rails—has entirely collapsed. Not a single ton of steel rails has been sent from Sheffield to the States for nine months! In the first three-quarters of 1874 the total declared value of steel rails exported from Sheffield to the States was £356,180. The last quarter of 1874 the value fell to £1156. In the first quarter of this year the value was £2301, and since that date the trade has been a thing of the past. No wonder we hear that another large company are about to close their rail mills for three months. The greatest exportation of Sheffield steel, steel rails, cutlery, &c., to the States, was recorded in 1872, when the declared value was £1,734,626. The smallest exportation was last year, when the total value was £691,232—the falling off, as compared with 1872, being no less than £1,043,-094.

The following is the declared value of the total exports of steel, hardware and other goods from Sheffield to the United States in 1875:

	£	s.	d.
January	56,349	12	8¾
February	63,271	9	7½
March	65,585	18	8½
	185,207	1	0¾
April	53,994	0	8¾
May	59,423	3	0¾
June	51,864	12	10½
	165,281	16	7¾
July	69,894	3	4½
August	60,941	16	0⅜
September	59,347	14	4
	183,183	12	9
October	50,106	6	10½
November	50,954	12	2
December	56,498	17	3½
	157,559	16	4
Total for the year	691,232	7	9¼

The following shows the totals in the three specialties of the Sheffield trade:

Quarter Ending March 31, 1873.	
Steel	£62,224
Bessemer steel rails	52,118
Cutlery	29,718
Quarter Ending June 30, 1873.	
Steel	165,906
Bessemer steel rails	93,584
Cutlery	67,192
Quarter Ending Sept. 30, 1873.	
Steel	155,986
Rails	82,899
Cutlery	90,429
Quarter Ending Dec. 31, 1873.	
Steel	130,377
Rails	84,905
Cutlery	62,027
Quarter Ending March, 1874.	
Steel	106,207
Bessemer steel rails	130,014
Cutlery	53,608
Quarter Ending June 30, 1874.	
Steel	113,734
Rails	134,911
Cutlery	37,064
Quarter Ending Sept. 30, 1874.	
Steel	113,486
Rails	91,955
Cutlery	79,803
Quarter Ending Dec. 31, 1874.	
Steel	34,302
Rails	1,156
Cutlery	19,757
Quarter Ending March, 1875.	
Steel	82,652
Bessemer rails	2,301
Cutlery	56,454
Quarter Ending June 30, 1875.	
Steel	95,358
Bessemer rails	nil.
Cutlery	30,652
Quarter Ending Sept. 30, 1875.	
Steel	88,559
Bessemer rails	nil.
Cutlery	57,650
Quarter Ending Dec. 31, 1875.	
Steel	87,294
Bessemer rails	nil.
Cutlery	35,827

We append the particulars of Sheffield goods sent to the States during the last quarter of 1875 as a specimen of the various "products" supplied:

DECLARED VALUE OF EXPORTS FROM SHEFFIELD TO THE UNITED STATES DURING THE QUARTER ENDING DEC. 31, 1875.

	£	s.	d.
Steel	87,294	5	9
Cast steel tyres	1,651	6	8
Cast steel tyre blanks	847	8	9
Cast steel axles	679	14	3
Cast steel crank axle	83	7	7
Frogs and frog points	60	16	11
Iron wire ropes	276	13	6
Anvils	471	9	11
Cutlery	35,827	0	3½
Files	7,789	15	4
Saws	130	13	0
Other tools	1,102	14	10½
Garden tools	48	14	3
Grass hooks	0	14	9
Sheep shears	4,348	8	6
Trays and waiters, iron	145	15	6
Plated goods	113	15	4
Plated metal	14	14	2
Guns, gun barrels, gun furniture, &c.	1,170	3	6
Shooting tackle, breech loading implements, &c	891	7	5
Measures, measuring tapes, rules, land chains, &c	286	18	1
Small bells	17	9	3
Optical goods	16	15	0
Magnets	66	0	1
Surgical instruments	104	4	4
Surgeons' lint	61	0	0
Doctors or calico web	161	0	8
Hackle pins	83	9	4
Umbrella ribs	783	18	0
Graining combs	15	7	6
Needles	8	5	9
Screws	26	13	2
Grindstones	311	14	2
Stag horn	23	3	6
Horn belt clasps, brooches, &c	324	4	6
Hogs' guts	65	9	4
Brushmakers' draft	86	11	0
Cotton warp seating	573	15	0
Salted skins	9,747	13	0
Glue	1,743	17	9
Crocus	5	11	0
Wine, sherry	32	7	9
Paper	12	10	0
Woodenware	9	0	9
Sundries	40	17	2
Total	£157,559	16	4

The following are the declared values of goods exported from Sheffield to America since the appointment of Mr. Abbott as Consul in 1864, the town previous to that date having been merely a consular agency:

	£	s.	d.
1864	811,714	4	7½
1865	824,593	17	4½
1866	1,445,878	9	4¾
1867	1,314,460	1	4½
1868	1,132,940	15	0⅜
1869	932,210	6	5
1870	1,285,706	18	10
1871	1,396,262	7	9½
1872	1,734,626	9	8¾
1873	1,659,773	2	5¾
1874	1,263,048	17	11
1875	691,262	7	9¼

Similarly depressing accounts are given of the saw, electro plating and tool trades.

The Useless Waste of Water.—The extreme cold of last winter caused the freezing of the Croton water in many of the service pipes, and to prevent this the people resorted to the practice of letting it run through the faucets continually, especially at night. This practice was resumed early this season, as is shown by the immense quantity of water drawn during the hours when all business is at rest. Stores are closed in the evening with the faucets open, letting more water run through them at night than is used during business hours. In consequence of this waste it is impossible to regain the supply drawn from the reservoirs in November last, when the aqueduct was closed during the annual inspection. The reservoirs want nine feet of being full, and the water is still falling, decreasing the pressure and stopping the supply to the upper stories of buildings. The acqueduct is bringing in all the water it can carry with safety, and if this waste is not stopped and the consumption reduced to within the capacity of the aqueduct, the pressure will be further decreased, until a large portion of the people who usually receive a full supply of water will be without it. Thus far the temperature has furnished no occasion to fear the freezing of pipes, and at small trouble and expense the pipes could be so protected as to greatly diminish, if not obviate, the danger of freezing.

The Western Bessemer mills appear to be well off for orders. The North Chicago mill started the year with orders for 30,000 tons. Cleveland, it is reported, has lately taken an order for Vanderbilt for 10,000 tons, and the Edgar Thomson has enough to run single turn until June. Just the figures for the Union & Joliet we do not have, but understand they are well stocked. The crop ends which heretofore have been the bug-bear of these mills are in active demand.

LEIGHTON BRIDGE AND IRON WORKS,

Rochester, N. Y.

Wrought Iron Riveted Lattice Railroad AND HIGHWAY BRIDGES.

Wrought Iron

WATER PIPE,

The most economical and durable Pipe manufactured for Water Works, Oil Lines or Gas Mains.

General Riveted Work

Orders solicited from Civil Engineers and Contractors.

[Accompanying engraving represents the Springfield Bridge, built by the Leighton Bridge and Iron Works.]

SPRING PERCH CO., Bridgeport, Conn.

Established 1843. Manufacturers of FIRST QUALITY

SPRINGS & AXLES

And Beer's Patent Curtain Rollers, Concealed Hinges, Etc., Springs of any pattern made to order. Send for Circular and Price List.

HISCOX FILE MANUFACTURING CO.

WEST CHELMSFORD, MASS.

FILES & RASPS

OF EVERY DESCRIPTION, ALSO ALL KINDS OF

MACHINE — RAG
MOULDING — STRAW
VENEERING — PAPER OR
LOG WOOD — TRIMMING

KNIVES

ADDRESS HISCOX FILE MANUFACTURING Co WEST CHELMSFORD, MASS.

BETTS & BURGER,
95 Chambers Street, N. Y.
Commission Merchants,
And Dealers in
Hardware and Cutlery Bargains.
Solicit Agencies and Consignments.

HARDY & CO.,
Manufacturers of
Police & Fire Department SUPPLIES.
Brass, German Silver & Leather Dog Collars.
102 ELM STREET, NEW YORK.

Stretches the wire each way, is tightened with a common wrench, is self-fastening at each half turn of the spindle. Warranted for strength and durability. Sold at hardware stores generally. Byington & Northup, sole manufacturers, Rochelle, Illinois.

Agents:—Hibbard & Spencer, Chicago; Excelsior Mfg. Co., St. Louis; John Nazro & Co., Milwaukee; George Tritch, Denver; Nelson & Co., Burlington, Iowa; Marshall Lefferts, Jr., N. Y.; J. S. brown & Co., Galveston, Texas

B. D. WASHBURN & CO.,
35 and 37 Batterymarch Street, BOSTON, MASS.
Blind & Sash Makers' Supplies, &c

Manufacturers Improved Screw Blind Fasts, Improved Elbow Hinges, Self-Locking Elbow Hinges. Wrought and Cast Blind Trimmings,

Adapted to the various markets in the country.

For all articles pertaining to the window we ask the trade's attention, as being the most extensive dealers in this country. Prices generally reduced.

Birmingham, England.
SAMUEL A. GODDARD & CO.,
Commission Merchants and General Agents,
execute orders for British manufacturers on the lowest terms, and collect and forward goods for a very moderate payment. Agents for the sale of North Staffordshire Iron of a standard quality.

FOOT LATHES.
Address,
W. E. LEWIS, Cleveland, O.
Catalogues free.

BLISS & WILLIAMS,
167 to 173 Plymouth St., Cor. of Jay,
Manufacturers of Presses and Dies.

No. 4495. Brooklyn, Feb. 2, 1875.

Mr. H. Schierloh,

24 Exchange Place, Jersey City.

Please Deliver

70 lbs. Welding Compound.

and oblige,

BLISS & WILLIAMS.

BLISS & WILLIAMS,
167 to 173 Plymouth St., Cor. of Jay,
Manufacturers of Presses and Dies.

No. 4525. Brooklyn, Feb. 22, 1875.

Mr. H. Schierloh,

24 Exchange Place, Jersey City.

Please Deliver

50 lbs. Welding Compound.

and oblige,

BLISS & WILLIAMS.

BLISS & WILLIAMS,
167 to 173 Plymouth St., Cor. of Jay,
Manufacturers of Presses and Dies.

No. 4594. Brooklyn, March, 30, 1875.

Mr. H. Schierloh,

24 Exchange Place, Jersey City.

Please Deliver

100 lbs. Welding Compound.

and oblige,

BLISS & WILLIAMS.

BLISS & WILLIAMS,
167 to 173 Plymouth St., Cor. of Jay,
Manufacturers of Presses and Dies.

No. 4755. Brooklyn, July 14, 1875.

Mr. H. Schierloh,

24 Exchange Place, Jersey City.

Please Deliver

100 lbs. Welding Compound.

and oblige,

BLISS & WILLIAMS.

BLISS & WILLIAMS,
167 to 173 Plymouth St., Cor. of Jay,
Manufacturers of Presses and Dies.

No. 4982. Brooklyn, Dec. 2, 1875.

Mr. H. Schierloh,

24 Exchange Place, Jersey City.

Please Deliver

100 lbs. Welding Compound.

and oblige,

BLISS & WILLIAMS.

BLISS & WILLIAMS,
167 to 173 Plymouth St., Cor. of Jay,
Manufacturers of Presses and Dies.

No. 5110. Brooklyn, Feb. 8, 1876.

M Schierloh Mfg. Co.,

24 Exchange Place, Jersey City.

Please Deliver

100 lbs. Welding Compound.

and oblige,

BLISS & WILLIAMS.

Charcoal Steel Direct from the Ore.

At an ordinary meeting of the Society of Arts, held recently, Sir F. C. Knowles in the chair, Mr. H. Larkin communicated an important paper entitled, "A Method of Producing Pure Charcoal Steel Direct from the Ore." He said: There is no subject in the whole circle of metallurgic art in which there exist such differences of theory and such uncertainties in practice as exist in connection with the very ancient art of making steel. We are not yet agreed even as to the specific compound we shall indicate by that long familiar word. For thousands of years we have been handling steel, for good and for evil, and familiarly speaking of it as if we knew what we were talking about, and yet, even to this day, it remains a mystery. Fortunately, however, with such speculations, we need not now trouble ourselves. My present subject is the good old-fashioned tool steel, such as the natives of India knew how to make a thousand years ago, the value of which is not to be measured by mere thousands of tons. Really excellent tool steel may be a comparatively small thing in a commercial point of view, but it stands absolutely alone for value amongst all the implements and utilities of civilized life. We could better part with all the metals ever dug out of the earth than we could part with the steel from which our tools are made. The perfection of our tools is but another name for the perfection of our material civilization, and every tool we can lay our hands to is made either of steel or by steel. Such being the importance of steel, one would have thought that among all the developments and applications of modern science, one of the first and most indispensable would have been to know how to make good steel with the same certainty and uniformity as we know how to make good sovereigns and shillings. But instead of this being the case, I believe I am stating a mere well known fact when I express my belief that there is not a manufacturer in Sheffield who really knows why his steel comes out sometimes good and sometimes bad. The bulk of our tool steel is still made, not by the light of science, with clear understanding of every step that is taken, but by the merest technical routine and rule of thumb. Some three or four years ago I was ambitious enough to hope that I might do some little to correct this anomaly. It seemed to me that the production of steel must necessarily be an uncertain thing so long as the ordinary routine of doing and undoing—of smelting and puddling, and converting, and sorting by rule of thumb, was continued. While occupied with these speculations, I was so fortunate as to obtain a few tons of the well known magnetic iron sand to experiment with; and my thoughts were—here is a perfectly uniform material, free from any impurity that would be injurious to the steel which might be made from it. If I can succeed in converting this material into steel by the agency of pure carbon and by strictly uniform treatment, I ought to succeed in producing a pure and uniform steel. My notion was to thoroughly mingle the powdered ore with powdered charcoal in accurately regulated proportions, and then to reduce it in closed retorts at the lowest practicable heat, so as to prevent the reduced metal from cohering together. I saw from the first that if I could only obtain my reduced metal in a pure and powdered condition I should have no difficulty in mixing together any reasonable bulk of such powder, so as to be uniform throughout; and that I could, by analysis or other experimental test, ascertain accurately what the entire bulk consisted of, and so know perfectly the material I was to work on. The next step I proposed was to prepare the material so obtained for being melted into cast steel of any required quality by adding to and intimately mingling with it just so much carbonaceous material as should be found necessary. This uniform mixture would only then need to be uniformly melted and worked; and so long as the operations of nature are uniform, the result obtained could be no less so. Such was the origin of my method for making pure charcoal steel directly from the ore; which method, after the usual experiences of long months of disaster and disappointment, I have now the great privilege of explaining in its matured and, I trust, modestly triumphant condition.

Before, however, proceeding any further with this explanation, it will probably be of some interest, and certainly it will be only fair to my less fortunate predecessors, if I give a short sketch of what, almost unknown to me at the time I speak of, others have done or have proposed to do toward the solution of this interesting metallurgical problem. So far as the records of the Patent Office informs us, Mr. William Neale Clay seems to have been the pioneer and first actual worker in this enterprize. In the year 1837 he obtained a patent for "Improvements in the manufacture of Iron." In his specification he says: "I take any quantity of red Lancashire or Cumberland ore, or other ores of a rich character, and break the larger lumps, by means of a pair of rollers or otherwise, to about the size of walnuts, which I believe to be the best size for working. With one hundred parts by weight of such broken ore I mix twenty parts of clean dry coal ashes, or cinders, or of coke, charcoal, charred peat, anthracite coal, or other suitable carbonaceous matter, broken so as to pass through a sieve of half inch mesh. The mixture is put into retorts or vessels, which I prefer to be of a D shape, about 7 feet long, and 18 inches high, and 2 feet wide, made of clay, fire bricks, iron, or other suitable material." There is no special arrangement for heating the retorts, beyond causing the waste heat from a puddling or other furnace to pass through flues, carried transversely beneath a row of such retorts, placed side by side, seemingly from the drawing given, to the fabulous extent of some 15 or more. It is quite certain that no such extensive arrangement of retorts was ever actually worked on this plan; but it is no less certain that Mr. Clay did really obtain a remarkable degree of success by his very simple, although crude arrangement. No further patented attempt of any note seems to have been made toward the solution of our problem until 1854, nearly 17 years later. In that year a patent was obtained by M. Chenot, the scope of which was very much wider and more ambitious. He proposes to make what he calls "metallic sponges" from which iron ores, by reducing them in closed furnaces by the agency of pure carbonic oxide. This pure carbonic oxide is to be expressly manufactured for the purpose in the first instance. It is then used for the reduction of the ore, during which operation it takes up another atom of oxygen, and becomes converted into carbonic acid. This carbonic acid is carefully collected as it passes from the reducing chamber, and a sufficient portion of it is reconverted into carbonic oxide by causing it to pass through "a retort containing carbonized matter at an incandescent or red heat." By this means, he says, "I obtain a rich source of pure carbonic oxide; and the use of gas, which has hitherto been impracticable, is made very easy and effectual." If, however, the ore from which the "metallic sponges" are thus made should not be of sufficient purity to produce metal of the quality desired, "the sponge is to be pulverized by any suitable apparatus, and after pulverization the matter passed to an electric sorting machine." No intelligible working description is given of this "electric sorting machine," and the only novelty claimed for it is "the use of electro magnets, employed to sort in a continuous manner," instead of "natural or permanent magnets, which have been used on a small scale to free brass filings from particles of iron." Nevertheless, the idea of applying it to such a purpose is of undoubted value, and M. Chenot is fairly entitled to the credit of having proposed it. Another idea of at least equal value is that, after the "metallic sponge" has been pulverized, and thus freed from extraneous matter, the metallic powder may, if necessary, be intimately mixed with carbonaceous matter and compressed into any desired shape.

There are many other ideas put forth in this specification which I need not specially refer to. The two points which seem to me to be really interesting, or at least which in any way anticipate my own method, are those which I have mentioned, namely, the "electric sorting machine" and the occasional pulverization of the "metallic sponge" and its subsequent compression in molds. There is no detailed description of any furnace or other apparatus by which the ideas are carried into practical effect, and there is very little that gives one the conviction of its having been written from actual working experience. In all cases "metallic sponge" is M. Chenot's leading thought, and he only proposes to pulverize it when it proves otherwise unmanageable. This metallic sponge he proposes to melt into steel, either in a cupola stratified with carbonaceous material, or in crucibles, or in the open hearth of a reverberatory furnace. The next patent bearing directly on our subject is dated only a few weeks after M. Chenot's. This is also by a French gentleman, M. Bellford. The specification describes a very elaborately arranged furnace, the one point of interest being that "the ore from which the steel or wrought iron is to be produced is first pulverized in a sufficient manner according to its general character, and next intimately mixed with charcoal or other sufficiently carbonaceous matter." After this, curiously enough, there is another interval of seventeen years before the records of patents show any renewed activity in our special direction. In 1871, Mr. T. S. Blair, of Pittsburgh, Pa., obtained a patent for "improvement in the means and apparatus for the reduction of iron ores, and for preparing the same for reduction." The specification describes very clearly two ingenious and perfectly distinct arrangements of apparatus for exposing finely pulverized iron ore to currents of heated reducing gas; and in 1872 Mr. Blair again comes forward with a patent for "Improvements in the manufacture of iron and steel, and apparatus therefor," the apparatus therefor consisting of a third arrangement of reducing furnace, much more elaborate than the two previous arrangements, and altogether different. In this third arrangement of furnace Mr. Blair proposes to use as a reducing agent either solid carbonaceous matter or "gas flames rich in carbon." But, he adds, "when the carbon is supplied in a solid state (as charcoal, coke, &c.), the mixture to be treated will be found a bad conductor of heat, and if the process were conducted in a chamber of large area, it would be impossible to convey to the central portion the necessary heat, so as to perform the work with regularity all through the mass. Hitherto this difficulty has not been successfully met. My improved method, which may be called 'initial heating,' removes the difficulty altogether." If this were true, Mr. Blair's triumph would be great indeed. But this notion of the importance of "initial heating" is based on a very evident fallacy, the fact being that the real pinch of the work lies in the final, not at all in the initial given to it. Mr. Blair has devised what appears to be a sufficiently effective arrangement for bringing the upper part of his furnace to a full reducing heat, and he seems to think that having once thus started the operation, he has only to let the material slip down into the body of his furnace with a very moderate supply of extraneous heat, when the process of reduction will continue of itself! The notion of this process of reduction of iron when once fairly started going on pretty much of its own accord, is, alas! but another instance of the "perpetual motion" futility, that brightest hope of the unregenerate human heart, to persuade nothing to bring forth something! I have no hesitation in saying that any possible improvement in the "initial heating" of our materials, instead of removing the difficulty altogether, would be a matter of little or no importance to the success or the economy of the operation. The initial heat may be a very dull red, without involving much loss of time. The first half of the oxygen is very easily and quickly got quit of. The iron at first seems ready enough to part with it; but it is very different when it comes to its last gasp. Then comes the real tug of war between iron and carbon; and nothing short of full red heat, with clear preponderance of carbon, would ever compel the iron to quit its final hold. There are, likewise, serious objections to upright retorts for reducing.

(To be continued.)

M. D'Arrest, the director of the observatory at Copenhagen, writes that he continues to devote the powers of his large telescope to celestial spectroscopy. His spectroscopic examination of the stars in the northern heavens continues to increase the number of stellar spectra which belong to the third class in a far larger proportion than any other of Secchi's four divisions. The stars of this type afford remarkable objects for investigation, and are pretty numerously and uniformly distributed throughout the heavens. Only a few other spectra have striking similarities among themselves. In some, the position and the groups of dark absorption bands are, as Secchi and Vogel have stated, in complete accordance. Groups occur in which even the various intensities of the bright lines are sometimes alike; these lines being, in general, brightest near the red end, although frequently exhibiting uniform brightness throughout the spectrum. But there is a remarkable uniformity in all the spectra. Out of 11,000 stars whose light has been thus examined, only 80 spectra offer characteristics worthy of special mention, and only five new stars are found whose spectra belong to the fourth class. On the average, therefore, where there is one star of the third class for every 140 stars examined, there is but one star of the fourth class for every 1000; and this holds throughout for all stars brighter than the eighth magnitude. In bright stars of the third type, dark absorption bands have several times been perceived. Only once, says D'Arrest, has he found a star of the sixth magnitude with distinct bands, departing in this respect from the characteristics of both the third and the fourth types, in which case, however, a short examination revealed to him that he was examining the planet Uranus, and not a fixed star. Twice in the course of his sweeps among the stars has he thus, with his small instrument, spectroscopically discovered this planet.

Some New Tools by Henry Disston & Sons.

We publish on another page a number of interesting cuts, illustrating some new tools manufactured by Henry Disston & Sons, of Philadelphia, and not included in their large illustrated catalogue issued last month. Fig. 1 represents the "Little Wonder" file, which possess many features of novelty. The file, which is of the ordinary taper pattern, has an incision upon each face, which, in addition to the thorough hammering given the blank, tends to condense the steel to a degree not attained by the ordinary process of manufacture. The tang is corrugated, giving it a better hold in the handle, and the end is finished with a "gum tip," which saves the thumb of the person using it from the painful abrasion to which all saw filers are subject. This improvement does not reduce the cutting length of the file. The tooth is of the exact shape, pitch, depth and angle which experience has shown to impart the greatest durability. A user of files writing from Fort Scott, Kansas, says: "One of these files has done more work than six of Butcher's files of the same class." The "Little Wonder" file is a practical tool in all respects, and the new shape of handle shown in the illustration, with four flat bearing surfaces, will commend itself to the approval of all experienced saw filers.

Fig. 2 shows a mill file with a hand protector, the utility of which is similar to that of the gum tip already described. The old style of square end with sharp corners has always been a great inconvenience to filers, causing painful sores in the palm. The blanks for these, as for all of Disston's files, are made from a high grade of steel, hammered under a 6-ton hammer and thoroughly condensed. They are all hand cut, and cost no more than other first-class goods.

Fig. 3 shows an improved plane bit which has many points of advantage. Some time ago Messrs. Disston & Sons put in new machinery for the manufacture of brick trowels, and it has since been adapted to the double duty of turning out trowel blades and plane bits. These bits are made of all steel, without a weld; consequently the metal is not burnt, and it will wear to the eye without showing a change in quality. The manufacturers claim that it will do more work than any welded bit, is equally strong, and can be ground in half the time. The cap is made in such a way that it never "crawls" or slips to one side, and is held in place by a 9-thread nut, instead of the 3-thread nut in common use.

Fig. 4 shows an improved combination trammel, marking gauge, square, bevel, mitre square and gauge for rabbitting, invented by one of Messrs. Disston's workmen. The manufacturers commend it highly as a useful, cheap and convenient tool for carpenters' use.

Fig. 5 is a new tool for mortising and tenoning. It can be adjusted to any mortise or tenon in a moment, and saves the carpenter much time and trouble.

Fig. 6 shows an improved screw driver, provided with a revolving button on the end of the handle. This obviates the necessity for loosening the hold and relieving the pressure when the tool is revolving, as when the point of the tool is inserted in the slot of the screw, a firm hold and steady pressure may be maintained by bearing on the revolving button with the left hand, while the tool is turned with the right. This is a marked improvement, and gives a straight screw driver many of the advantages of a stock and bit.

Fig. 7 shows a new style of saw provided with a malleable iron handle frame and wooden hand hold. The frame of the handle is very light and is held to the blade by solid metal rivets. The back of the saw is straight, and the shoulder of the handle frame, also perfectly straight, is so secured to the blade as to make a right angle, constituting a perfect square. The true back of the saw blade, which is eighteen inches in length, is marked with inches and parts of the inch, and with the aid of a pocket level this saw will give the carpenter a perfect plumb and a perfect level. This is an ingenious and useful combination of saw and square, which especially adapts the tool to a great variety of jobbing work and is held in high esteem by the manufacturers.

The illustrations described above will be found on page 29.

Steel Patent Steam Jet.

We present herewith a cut of the steel steam jet used for producing a draught in boiler furnaces, either marine, stationary or locomotive. It was especially designed for marine work, but is equally well adapted to all places where

large stacks are used and a good draught is desired. In our river steamers it has always been found necessary to use a forced draught, which is commonly produced by an independent blowing engine. These not only take up a great deal of room and require much attention, but are wasteful of power, and commonly are driven in a manner not at all conducive to the safety of the boat—at least, not when blowing into a closed ash pit or tight fire room. On locomotive engines the simple steam jet works admirably, and attempts have been from time to time made to apply this principle to the larger stacks of marine and stationary boilers. In marine work only has it had any success, but on account of the very great obstruction of the draught, the apparatus was somewhat wasteful, since the natural draught of the stack had to be entirely destroyed in the production of an artificial one by means of the jet. Mr. Steel, finding these objections to the ordinary jet, devised a modification by which a powerful draught could be obtained, and, at the same time, the natural draught be practically uninjured when the jet was not in use. With the ordinary jet the chimney has to be partly closed to bring the gases within reach of the jets of steam which form a line across the stack. Consequently, the area of the chimney is very greatly reduced.

In the jet which we illustrate the gases in all parts of the flue or chimney are reached by a multitude of small jets of steam, which is supplied from a central distributing chamber. This is supplied with steam from the boiler. The object of this chamber is to give an equal distribution of steam to the pipes which radiate from it, each of which carries steam to several perforated nipples. By means of this chamber the pressure of steam at each of the outlets is equalized. It will be seen that by this arrangement there are a great number of small jets distributed over the whole area of the flue, thus giving all the gases an upward impetus, while at the same time the pipes obstruct the draught but little. In a 40 inch stack, which we have seen, the central chamber is four inches in diameter, with eight pipes three-quarters of an inch in diameter branching from it. These eight pipes, with their branches, carry 80 nipples with three holes each. The small pipes upon which the nipples are carried are one-quarter diameter. Jets of this kind have been used with eminent success by several of the passenger boats plying in our harbor. The inventor and patentee is Mr. Geo. C. Steel, Third avenue, between 139th and 140th streets, New York. We should not omit to say that the jet is under perfect control from the engine room, a cord controlling the valve so that the natural draught may be increased to any desired degree. This device can be used with great effect in ventilating the lower holds of ocean steamers, clearing out hot or vitiated air in various locations by simply placing it in a sheet iron wind sail, one of about twenty inches in diameter answering very well for ordinary situations. A down cast shaft of equal size, or an opening into the fresh air, is of course needed.

The Manufacture of Zincin St. Louis.

In Carondelet, a Southern district of St. Louis, there is a manufacturing interest in spelter of considerable importance. There are three quite large works, the Martindale, Carondelet and Missouri, with a united capacity of some 32,000 lbs. per day—that is, 18 furnaces—and 1656 retorts. The yield varies so much, according to the ore used, that an accurate statement cannot be made. The companies there, uniting with three others, form the "Combination Zinc Co., with a capacity of 31 furnaces, and exert an important influence on the zinc trade of the country.

The manufacturers have, undoubtedly, great advantages with the facilities of transportation over the Iron Mountain and Southern Railroad and the Atlantic and Pacific Railroad, which bring the ore direct from the mines throughout the State, where there is an almost unlimited supply. The ores used are the "Calamine," or carbonate (Ln CO_3), and a silicate; the Martindale Co. also largely using the zinc blende (Ln S) commonly called "black Jack." This latter, however, requires an especial process to remove the lead and other impurities associated with it before being placed in the retorts. The process is similar in all the works, and founded on the fact that zinc readily melts at 773°, and at a bright red heat volitalizes as oxide of zinc, which is easily condensed.

The ores are first subjected to a roasting process in a kiln very similar to the ordinary lime kilns, for the purpose of loosening or breaking up the hard masses, and, in the case of the carbonate, to remove the carbonic acid, causing a loss in weight of some 30 per cent. The ore is then taken to the rollers, where it is reduced to a very fine state, almost a powder, in which condition it is mixed with about equal parts of coal slack (by muddy coal used), and is ready for the retorts.

The retorts consist of fire clay cylinders some four feet long, with a diameter of ten inches and a capacity averaging fifty pounds. They are arranged in the furnace in rows, from 70 to 90 retorts to the furnace; one end is open to the workmen, the rest exposed to the flames from below. When charged with ore the "condenser," a conical shaped vessel of fire clay, is attached to the open end and all cracks carefully "luted" and stamped with clay, one or two small holes being left for the escape of the excess of the gases. The lower rows which are exposed to a greater heat, have vessels of similar form to the condensers (but of some light metal) attached to the condensers, as offering an additional condensing surface for the zinc oxide. These retorts with their charges of ore are exposed to the required temperature from twelve to twenty-four hours, according to the position in the furnace, after which one end of the condenser is opened and the liquid metal allowed to flow into a ladle, the condenser taken off, and after the refuse ore and coke is removed from the retort it is ready for another charge. The metal is poured from the ladle into an iron mold, and when cold weighs about thirty pounds, and is ready for the market under the name of spelter.

In using the zinc blende (which is generally associated with Galena) the Martindale Company are obliged to first crush by rollers, and then thoroughly wash the ore, after which the lead separates out as a powder, and so completely that on examination of the washed ore it is very difficult to find a trace of lead. The sulphur is removed from the zinc by a roasting process in a reverberatory furnace, escaping as sulphurous acid gas; it is then taken to the retorts and treated as above described.

Special Notices.

IMPORTANT ANNOUNCEMENT

To Hardware Maunfacturers and the Trade.

BISSELL, WELLES & MILLET,

will hold their

First Spring Trade Sale for 1876,

At their store, *No. 15 Murray street*, at 10½ o'clock, a. m., on Tuesday and Wednesday, February 29th and March 1st, of

Heavy and Shelf Hardware, Cutlery, Guns, House Furnishing Goods, Etc., Etc.,

Comprising a full line of assorted Hardware, Files, Locks, Mechanics' Tools, Builders' Hardware, Shovels, Cutlery, etc., etc., direct from the manufacturers, and in quantities to suit large and small buyers. The manufacturers are requested to forward us their invoices and goods for this sale if possible on or before the 25th inst., to enable us to properly classify and arrange the goods. Buyers can rest assured that all goods sold by us are fairly sampled and catalogued, and no sale if not as represented.

BISSELL, WELLES & MILLET,
Auctioneers.

Partner Wanted,

In large Iron Property. Charcoal Furnace and Forge Works leased for $12,000 per annum, quarterly payments. Room for other works. Make best quality metal. Address

P. O. Box 863, Baltimore, Md.

To Manufacturers and Patentees.

Wanted useful patented articles for manufacture, suitable for sale by hardware dealers. Cash will be paid for patents or advance made for royalty.

Address, **P. P. PRATT,**
Care **PRATT & CO., Buffalo, N. Y.**

Wanted.

A superintendent for Puddling Mill; one who thoroughly understands Balling with Draft Furnaces. Best of reference required from former employer.

Address, **A. R.,**
Office of *The Iron Age*, 220 S. 4th St., Philadelphia.

ROLLING MILL SUPERINTENDENT Wanted.

A competent man, who can take an interest in a mill running on specialties in one of the most promising towns of the West. Address, **W.,**
Office of *The Iron Age*, 10 Warren St., N. Y.

Business Opportunities.

New Capital Procured, Partnerships Arranged, and Commercial, Mining and Banking Corporations Organized, by

CLARKE, CHITTY & CLARKE,
Board of Trade Offices, New York.
P. O. BOX, 4071.

NOTICE! POND'S TOOLS.

The undersigned has assumed the Personal Property, including accounts, finished and unfinished Machinery, good will &c., connected with the manufacture of MACHINIST'S TOOLS as conducted by Mr. Lucius W. Pond since 1847, and will continue the said business at the old stand, cor. Union and Exchange Sts., Worcester, Mass., under the name of DAVID W. POND, Successor to Lucius W. Pond.

CARD.—Having assumed the business mentioned above, I solicit Inquiry and Patronage, with guarantee that present standard of Workmanship, and quality of Machinery shall be maintained. A large quantity of NEW AND SECOND-HAND TOOLS, ALL STYLES AND SIZES, For Sale at Low Prices. Send for list of second-hand tools. Store at 98 Liberty St., New York, will be discontinued from Feb. 1, 1876, and all sales made from manufactory.

Respectfully, **DAVID W. POND,**
Successor to LUCIUS W. POND.

DISSOLUTION OF COPARTNERSHIP

The firm of McClernan & Hymes is this day dissolved by mutual consent. The business of the firm will be liquidated by M. McClernan alone, No. 130 Liberty Street.

NEW YORK, Jan. 20, 1876. M. McCLERNAN, D. HYMES.

HARDWARE SPECIALTIES

Manufactured to order on favorable terms.
POWER AND ROOM to Rent by the
CORRUGATED METAL CO., East Berlin, C.

To the Iron and Hardware Manufacturers of America.

The subscriber, with 27 years' active experience in the general Hardware trade of this country, proposes to establish a General Hardware Commission House, at Melbourne, Australia, to represent the Iron and Hardware Manufacturers of this country in that market.

I have closed contracts with several *First-Class Houses*, and wish to fill my list soon as possible before leaving this country, which will be about March 1st. I invite correspondence of *First-Class Manufacturers* on the subject. I am ready at all times to answer questions in regard to imports and exports, general trade, customs duty, resources, &c., of the island. Letters after Monday next will reach me in New York, in care of *The Iron Age;* after the 23d January at Dansville, N. Y. Personal interviews preferred.

My list comprises *ten* branches in the trade. I shall represent only one house of each branch. Now, gentlemen, is your time to push your goods into that market and avail yourselves of the services of a live man, who will go there in person to look after your interest. Can give the best of rererences in regard to character and business capacity.

I shall establish, as a branch, a *Corresponding Agency*, with a connection in New York, through which American Iron, Hardware and Agricultural Manufactures and their kindred branches, can obtain *reliable* information of the wants and resources of the island, and their relative value compared with foreign goods in that market. I shall furnish my New York house such information and changes every month as may occur, and new matters as I observe them on the ground. Will be pleased to receive Catalogues, Price Lists, Circulars, &c., for guidance in my office at Melbourne.

CARL STEPHAN,
Dansville, N. Y.

Special Notices.

SPECIAL NOTICE.

I have three patents for Dies, Machinery, and Tools for making Augers and Bits, each running seventeen years; dated as follows: Dec. 19, 1865; January 31, 1866, and July 3, 1866. **There is a special claim on each of the Dies.** All persons infringing on said patents will be held responsible to the extent of the law. **Russell Jennings.**
DEEP RIVER, Conn., Sept. 7, 1874.

WANTED TO PURCHASE,

100 tons good Second-Hand T Rails, 18 or 20 lbs. per yard.

Address, giving particulars,
PIPER & THOMPSON,
Lapeer, Mich.

TO LET,

A Light, Handsome Office.

Possession Immediately.

HERMANN BOKER & CO.,
101 Duane Street, N. Y.

MANUFACTURERS

desirous of introducing their goods to the **British** and **Continental** Markets, are advised to insert advertisements in the newspaper **"IRON,"** published every Saturday, at *99 Cannon Street, London, E. C.*

SCALE: First 3 lines, 3/; every additional line, 10d. Price, 6d. per Copy, or 30/ per annum, inclusive of postage to the United States.

HALL & HARBESON,
Manufacturers of
Chemical & Physical Instruments,
191 Greenwich Street, N. Y.

SPECIALTY.—BUNSEN'S GAS BURNERS, for all heating purposes; BUNSEN'S IMPROVED GAS COMBUSTION FURNACES, with 10, 15 and 25 burners. Fine Brass and Metal Work made to order for Metallurgists, Chemists, Experimenters, Colleges, &c.

Steel Castings.

Solid and Homogeneous. Guaranteed tensile strength, 25 tons to square inch. An invaluable substitute for expensive forgings, or for Cast Iron requiring great strength. Send for circular and price list to
CHESTER STEEL CASTINGS CO.,
Evelina St., Philadelphia, Pa.

Wanted—A Partner,

In a foundry and machine business, already well established. Locality splendid and healthy.

A practical man with means is wanted to join a practical man who is already well established.

Address *CAR WHEEL FOUNDRY,*
P. O. Box 134, Selma, Alabama.

Briesen's Patent Agency

FOR SECURING INVENTIONS, TRADE MARKS, &c., IN AMERICA AND EUROPE,

No. 258 Broadway, New York.
A. V. BRIESEN.

Merchant Iron or Nails

Wanted in exchange for 300 tons No. 1 Wrought Scrap Iron.

GILCHRIST & GRIFFITH,
Mount Pleasant, Iowa.

A. PURVES & SON,
Corner South & Penn Streets, Phila.,
Dealers in
Scrap Iron & Metals, Machinery, Tools, Shafting & Pulleys, Steam Engines, Pumps & Boilers, Copper, Brass, Tin, Babbit Metals, Foundry Facings. Best Quality Ingot Brass.
Cash paid for all kinds of **Metals** and **Tools.**

DROP FORGINGS.

The TRENTON VISE & TOOL WORKS, Trenton, N. J., having increased their facilities, are now able to do all kinds of

Iron and Steel Drop Forgings

in quantities to order at reasonable rates.

HERMANN BOKER & CO., Proprietors,
101 & 103 Duane St., N. Y.

SITUATION WANTED

By a man of ten years' experience in the Mercantile Iron business. Is thoroughly acquainted with Bar, Sheet and Plate Iron business, and has an extensive acquaintance throughout the West, having for seven years successfully filled the position of traveling salesman. Will be open to an engagement from January 1st. Address,

T. S., 60,000 lbs.,
Office of *The Iron Age*, 10 Warren St., N. Y.

WANTED.—Situation as salesman in a manufactory of Hardware of any description. Twelve years' experience traveling in the West.

Address **W. C. THAYER,**
Wood's Hotel,
116 & 118 Fifth Ave., Chicago, Ill.

DISCOUNT LISTS.

Hinges and Butts. { Stanley Works' List...10 % to 50 % each, 75c. / Union Mfg Co.'s.....10 % to 60 % " 75c.

Bolt, File and Hinge and Butt List.—Contains all the lists and discounts that are used.....Price $1 00

Dayton & Lamberson, 97 Chambers St., N. Y.

WANTED.—A first-class business man familiar with machinery and manufacturing, capable of handling large bodies of men, desires a responsible position. References satisfactory. Address,
IRON AND STEEL,
Care of *P. O. Box 813, Bridgeport, Conn.*

Worcester Free Institute.

APPRENTICE CLASS,

Enter January 29. Address,

Prof. C. O. THOMPSON,
Worcester, Mass.

Wanted,

by a young man, thoroughly acquainted with the *General* Hardware business, also *Builders'* Hardware, a situation as salesman or stock clerk. Has had 13 years' experience and can give the best of references as to ability, character, etc. Will locate at any point offering him a business opportunity. Address, **THEO. F. CLARK,**
P. O. Box 530, Po'keepsie, N. Y.

Special Notices.

An Experienced Traveler

with a good connection in the N. E. States and Canada, desires an immediate engagement to represent a first-class house in the hardware trade.

Address, **TRAVELER,**
P. O., Everett, Mass.

For Sale.

FOR SALE.
Valuable Iron Property.

The Rolling Mill, Nail Factory, Blast Furnace, Ores, Lands, &c., of the Hollidaysburg, and Gap Iron Works, formerly known as the Juniata Iron Co., at Hollidaysburg, Blair County, Pa., are offered for sale separately or as a whole. Terms easy.

If not sold or otherwise disposed of prior, the entire property will be offered at Public Sale at the American House, in Hollidaysburg, *Wednesday, March 15, 1876, 11 o'clock A. M.*

No more desirable property in the market. For further information, address,

A. K. BELL, President,
Hollidaysburg, Pa.

FEBRUARY 7, 1876.

AT FURNACE SITE,

☞ **On the 23d Mar. 1876, at 12 o'clock, Noon.**

FOR SALE at Public Auction

The Napanock Blast Furnace Property.

Description of the furnace is about as follows: Hight of stack 46 feet high, and 12 feet bosh, built of stone to top of bosh, thence up of brick banded with heavy iron; lining is of fire brick 20 inches thick. Hearth and bosh are of fire brick. Tunnel head is 6 feet diameter. Hot blast was erected by Mr. McHose, of Reading, Pa.; is first-class, almost new. The power is of water, said to be of double the capacity; one of the best water powers in the State. Wheel is overshot, 26 feet diameter 6½ feet face. Capacity of furnace 20 tons Anthracite iron or 15 tons of charcoal iron, Woodland is abundant, from $3 to $6 per acre, for many years. Ores by railroad or by Delaware and Hudson Canal, which passes Napanock, which is a thriving place, two miles from Ellenville, Ulster Co., New York.

For further particulars, apply at furnace or of

H. BANGE,
94 Gold Street, New York City.

FOR SALE.

TESTING MACHINE, built by the South Boston Iron Co., arranged for tensile and compressive strains, capacity 150 tons.
MILLING MACHINE, built by Brainard Milling Machine Co., cutters swing 28 inches diameter, and spindle set at right angles, which insures accurate work
IRON ROOF, that covered New England Iron Co.'s Mill, 8 arches 80 feet span, posts 18 feet high, building now 80 feet wide by 90 feet long.
ROLLING TABLE, for straightening Iron.
PUDDLE TRAIN, for Billets and 3, 4 and 6 inch Bars.
FIVE DRILLS.
CORRUGATING MACHINE, Complete.
CORRUGATED SHEET IRON and barbed Nails.
SMALL UPRIGHT ENGINE, 15 H. P., 8 inch cylinder.
PUMPS, Etc.

Apply to **WM. E. COFFIN & CO.,**
8 Oliver Street, Boston.

HARDWARE BUSINESS For Sale.

In the city of Norwich, Conn., an old stand facing two streets. Rents low. Good help and doing a prosperous business. Large back country. The best of reasons given for selling. Address,
FULLER & PARISH, Norwich, Conn.

For Sale,

Stove and Tin Business.

Will sell, on good terms, one of the best arranged House Furnishing Stores in Canada West, at St. Thomas. The premises are roomy, the buildings having been arranged especially for this trade, with Tinsmith's workshops and benches complete for 12 men.

Present Stock about $6000.

St. Thomas is the head quarters of the Canadian Southern Railway Co. To a practical, energetic man this offers unusual advantages. Business well established and with good connection. Reason for disposal, present proprietors increasing their wholesale and retail Hardware Store next door to the above premises. Address

HORSMAN & HORSMAN,
Iron and Hardware Merchants,
St. Thomas, Canada West.

FOR SALE.

At Lowest Manufacturers' Rates.

GUNS & SHEET ZINC,

Best German and Belgian Brands,

By *LOUIS WINDMULLER & ROELKER,*
20 Reade Street, N. Y.

FOR SALE.

An ¾ inch mill train for making Merchant, Band and Hoop Iron. Will be sold cheap.

Apply to **W. W. JONES,**
Near the Lehigh Valley Railroad Depot,
Allentown, Pa.

FOR SALE.

at 10c. a copy, Weekly Spanish Review and Prices Current. The undersigned is also a *Translator* from and into the English, Spanish, French and German. *Latest Translations made:* for the governments of Germany and Spain, Pacific Mail S. S. Co., Walter A. Wood; Morris, Wheeler & Co.; Todd & Rafferty; John T. Dunkin; Fisk & Hatch; R. W. Wilde; Wilson Sewing Machine Co.; J. Hess & Co.; H. Marquardt; M. Echeverria & Co., and Chas. E. Little, New York; Hocking Valley Mfg. Co.; W. F. Potts, Son & Co., Phila.; Atlantic and Pacific Land Co.; R. E. Flemming, Jersey City; Wilder & Co., Savannah, and the Tanite Co.; Stroudsburg ("Emery Grinder"), to whom he refers.

☞ **Estimates furnished of translations and setting up of Spanish, German and French Catalogues for the Centennial.**

C. KIRCHHOFF,
Metal Reporter of "The Iron Age,"
Box 3091, New York P. O.

Trade Report.

Office of THE IRON AGE,
WEDNESDAY EVENING, Feb. 9, 1876.

During the past week there has been a considerable general activity in Wall street, especially in the stock market. The money market is easy, and borrowers on call with government bonds to pledge as collateral, are freely accommodated at 3 @ 3½ per cent. The rate on pledge of stocks is 4 @ 5 per cent. The amount of business paper offered is not large, and the discount rate on prime endorsed is 5 @ 6 per cent.

The gold premium has ranged between 112⅝ and 113⅝. The supply of cash coin is large, and holders have to pay full rates for carrying. In its general tone the gold market may be described as dull and steady. The following table shows the daily range of the premium since our last report:

	Highest.	Lowest.
Thursday	113	113
Friday	113	112⅞
Saturday	112¾	112⅝
Monday	112⅞	112¾
Tuesday	113	112⅞
Wednesday	112⅞	112¾

The market for government bonds is strong and active. Railroad mortgages are strong and in active demand at advanced prices. We give below the closing quotations of governments.

The stock market has been active, and, in the main, strong and advancing. The amount of business done has been large, principally in Lake Shore, Western Union, Northwestern, Pacific Mail, Ohio & Mississippi, St. Paul, Rhode Island, New York Central and Erie. We give below the quotations of shares on the active list at the close of business to-day.

The last bank statement shows a decline of $415,300 in the total reserve and an increase of $4,485,200 in deposits. The surplus reserve of the banks is $14,799,725, or $706,000 less than last week. The following is a comparison of the averages for the past two weeks:

	Jan. 29.	Feb. 5.	Differences.
Loans	$262,207,000	$266,067,400	Inc...$3,860,400
Specie	22,481,700	23,570,800	Inc.. 1,089,100
Legal tend'rs	44,030,000	47,356,200	Inc... 673,800
Deposits	230,023,900	234,509,100	Inc....4,435,200
Circulation	17,757,300	17,449,300	Dec... 308,000

The movements in foreign trade for the week are shown in the following tables:

IMPORTS.

For the week ended Feb. 5:

	1874.	1875.	1876.
Total for week	$7,929,642	$5,926,495	$6,756,290
Prev. reported	25,645,597	25,838,137	27,700,984
Since Jan 1	$33,575,239	$31,764,632	$34,457,274

Among the imports of general merchandise were articles valued as follows:

	Quant.	Value.
Brass goods	4	$307
Bronzes	7	1,012
Chains and anchors	80	3,355
Copper		8,041
Cutlery	102	38,980
Gas fixtures	1	736
Guns	4	694
Hardware	20	2,965
Iron, pig, tons	10	370
Iron, cotton ties	805	2,129
Iron, other, tons	146	9,842
Iron ore, tons	200	308
Lead, pigs	1,343	3,938
Metal goods	140	15,469
Nails	9	1,050
Needles	8	4,865
Old metal		142
Plated ware	1	50
Per. caps	21	3,821
Saddlery	2	1,402
Steel	412	9,693
Tin, boxes	24,305	138,610
Tin, 300 slabs	11,363	2,840

EXPORTS OF SPECIE.

For the week ended Feb. 5:

Total for the week	$713
Previously reported	393,699
Total since Jan. 1, 1876	$394,411
Same time in 1875	146,463
Same time in 1874	105,504

Government bonds at the close were strong at the following quotations:

	Bid.	Asked.
U. S. Currency 6s	125½	125½
U. S. 6s 1881, reg	122½	122¾
U. S. 6s, 1881, cou	122½	122¾
U. S. 5-20 1864, reg (Called)	114¾	—
U. S. 5-20 1864, cou (Called)	114¾	—
U. S. 5-20 1865, reg	117⅞	118
U. S. 5-20 1865, cou	117⅞	117¾
U. S. 5-20 1865, new reg	119¼	119½
U. S. 5-20 1865, cou	119¼	119½
U. S. 5-20 1867, reg	121⅛	121⅞
U. S. 5-20 1867, cou	121⅛	121¼
U. S. 5-20 1868, reg	123¼	123½
U. S. 5-20 1868, cou	123¼	123½
U. S. 10-40 reg	116⅝	116¾
U. S. 10-40 cou	120	120½
U. S. 5s, 1881, reg	117⅝	117¾
U. S. 5s, 1881, cou	117⅝	117⅝

The following are the closing quotations of active shares:

	Bid.	Asked.
Atlantic & Pacific R. R. Preferred	5⅛	5⅞
Atlantic and Pacific Telegraph	20⅛	20⅝
Chicago & Northwestern	41⅞	42
" " Pref	63	63¼
Chicago, Rock Island and Pacific	108⅞	109
Chic., Bur. & Quincy	119⅞	119¾
Col., Chic. & Ind. Cent	5	5¼
Clev., Col., Cin. & Ind's	55⅛	56
Cleveland and Pittsburgh	95	95¼
Chicago & Alton	103¾	104¾
" " Pref	109	110
Consolidation Coal	46¼	49
Canton	44	46
Del. Lack. and Western	118⅝	119½
Delaware & Hudson Canal	120⅞	121
Dub. & Sioux City	72½	73
Adams Express	109¼	109¾
American Express	63	63½
United States Express	68¼	68½
Wells, Fargo & Co. Express	87	87½
Erie	16⅛	16¾
Harlem	138	140
Hannibal & St. Joseph	18	18¼
" " Pref	28¾	28½
Illinois Central	99⅛	99½
Kansas Pacific	13	14½
Kansas & Texas	8¼	8¾
Lake Shore	65	65½
Michigan Central	59⅛	59½
Morris & Essex	102¾	103½
Milwaukee & St. Paul	42⅛	42¾
" " Pref	79½	79¾
Mariposa	8½	9
" " Pref	8¾	10½
New York Central	112⅜	113
New Jersey Central	109¾	110
Ohio & Mississippi	21⅛	21½
Pacific Mail	35¼	35½
Panama	130	134½
Pittsburgh & Fort Wayne	101¼	102
Pacific of Missouri	13¾	14
Quicksilver	17	18
" " Pref	20	23
St. L., Kan. City Northern	5	5¾
" " Pref	27½	28½
Tol., Wabash & Western	6	6¼
Union Pacific	68½	68¾
Western Union Telegraph	77¼	77¾

GENERAL HARDWARE.

We hear of a fair business, principally from letter orders and travelers' memorandums, but it is too early yet to expect any general activity. Very few changes in values have occurred during the week, and the general impression prevails that the season's trade will be marked by firmness in prices, and little disposition on the part of either manufacturers or dealers to sell goods without a reasonable profit.

A Western correspondent, speaking of the condition of business in his locality, says: "The few days of frost and snow we have experienced, and are still enjoying, has already brought an improvement in the demand for Horse Shoes, Ice Tools, and other seasonable goods. There is no material alteration in the general aspect of trade or prices."

The American Screw Company are considering the establishment of a large screw factory at some suitable point in Canada, where they can employ a part of their machinery in making Screws for foreign sale.

On the opposite page we print an article relating to some new tools which Henry Disston & Sons have added to their already immense assortment. The illustrations referred to in the article will be found in their advertisement on the 29th page.

The Hart, Blivin & Mead Mfg. Co. have in press their revised discount sheet, which will be ready for delivery in a few days.

J. Clark Wilson & Co. illustrate, in their advertisement on the 10th page, H. Clark's Superior Brad Awls and Tools, which they quote at the following list, less discount 50 per cent.:

	Per doz.
No. 1 Brad Awls, only (10 Awls) Pol. Apple Handles	$10 50
No. 2. Brad Awls and Tools (20 Tools)	12 50

Packed in Black Walnut Boxes with slide covers, half a dozen in a box.

They also illustrate Wilder's Socket Scratch Awls, one of the best-made tools of its class that we have seen, which they quote at $1·50 per dozen, discount, 20 per cent. They have changed the list price of Snell's Countersink Gimlet Bits from $1·25 to $2·25 per dozen; the discount, 25 per cent., remains as before.

The Norwich Lock Mfg. Co. have issued, under date of January 1, a price list and supplementary illustrated catalogue, to be attached to their 1874 catalogue. The following discount sheet accompanies the list. Quackenbush, Townsend & Co., No. 85 Chambers and 67 Reade streets, are their agents in this city:

Regular Discount 40 per cent.

OFFICE OF THE NORWICH LOCK MFG. CO.,
NORWICH, CT., Jan. 1, 1876.

GENTLEMEN: Our discount to your house, until further notice, will be 40 and 5 per cent., cash, and 2 per cent. for cash settlements within 30 days. Purchases amounting to $375 or more, net, before July 1, 1876, will entitle you to an extra 5 per cent. Respectfully yours,
NORWICH LOCK MFG. CO.

The demand for Nails is fair, and the market is a firm one at our quotations. We quote as before, 10d., $2·99, net. For orders of 200 kegs and over this price would be shaded.

On and after this date the Patent Corrugated Strapped Grain Scoops and Coal Shovels, manufactured by H. M. Meyers & Co. (Semple, Birge & Co., agents), will be sold at 75 cents per dozen extra, net. To parties who, during the season ending December 31st, 1876, purchase 25 dozen of these goods, no extra charge will be made for the corrugation.

The Rhode Island Horse Shoe Company have issued the following circular, showing a general reduction in prices. Horse Shoes from store in this city are quoted at 12½c. per keg advance on these rates:

Circular No. 1.

OFFICE OF THE RHODE ISLAND HORSE SHOE CO.,
PROVIDENCE, R. I., Feb. 4, 1876.

TO THE TRADE:—We take pleasure in again offering you the several brands of Horse and Mule Shoes manufactured by us. The rapidly increasing demand from all sections of the country for these goods is a sufficient guarantee of the many superior qualities they possess. Thanking you for your patronage in the past, we hope, by strict attention both to the details of manufacture and to the wants of the trade, to merit a continuance of your favors.

We are prepared to receive orders for our Horse and Mule Shoes upon the following prices and terms:

Perkins' Pattern Horse Shoes	4½c. per lb., cash.
" Mule Shoes	5½c. " "
Perkins' Snow or Trotting Shoes	5½c. " "
Rhode Island Pat'n Horse Shoes	4¾c. " "
Rhode Island City Pattern Horse Shoes	4¾c. " "

Free on board cars at the works at Valley Falls, R. I. Freight to New York 10 cents per keg.

A specification of sizes will be required when orders are accepted. Shipments will be promptly made in their turn. Terms of payment, cash in 30 days from date of invoice. If unpaid, subject to sight draft without notice. We reserve the right to decline orders, also to advance prices at any time except upon contracts made prior to such advance. Strikes of operatives or suspension in case of fire will relieve us from prompt fulfillment of contracts. Shoes assorted as required.

Messrs. Horace Durrie & Co., 97 Chambers and 81 Reade streets, New York, will continue to act as our agents, and they are authorized to sell, at all times, at our lowest factory prices. A full assortment of our Shoes we purpose to keep in their store, ready for immediate delivery.
RHODE ISLAND HORSE SHOE CO.
F. W. CARPENTER, President.

The Humason & Beckley Mfg. Co. have issued a condensed price list of the goods of their manufacture. The list prices are the same as those contained in their illustrated catalogue of Jan. 1, 1874. The following are their discounts, revised to Jan. 1, 1876:

Discount Sheet of the Humason & Beckley Mfg. Co., 100 Chambers street, N. Y., Revised Jan. 1, 1876, for Wholesale Dealers.

Please attach this to our Catalogue of Jan. 1, 1874.

	Discount per cent.
Bolts	40&10
Cupboard or Closet Latches	40
Hand Rail Screws	40&5
Cork Screws	25&10
Key Rings	33⅓
Nut Crackers—for Table	33⅓
Nut Picks	25
Malleable Hooks and Eyes—Oval	60&10
Skaters' or Pocket Gimlets	40
Pliers	25&10
Cotton Hooks	25
Pruning Hooks	10
Screw Drivers	25
Marking Awls	40
Belt Awls	10
Box Hooks	25
Box Scrapers, with two Handles	25
Saw Sets—Nash's Patent	20&10
Belt Punches	20
Saddler's Claw Tools	20
Mincing Knives	20&10
Kitchen Knives	50
Can Openers—McGill's	40
Cleavers	10
Knife Sharpeners—Nash's Patent	10
Ice Picks	33⅓
Carpet Claws	20&10
Butter and Cheese Tryers	25
Curling Irons	60
Wrought Hooks and Staples—Plain and Japanned, Hand Forged	70&10
Wrought Iron Staples—Plain and Japanned, Hand Forged	70&10
Wrought Hasps and Staples—Plain and Japanned, Hand Forged	70&10
Wrought Rings and Staples—Japanned, Hand Forged	70&10
Rings—Japanned	70&10
Wrought Awning Hooks—Hand Forged	70&10
Wrought Meat Hooks—Tinned, Hand Forged	70&10
Cattle Leaders	60
Bow Pins	50&10
Bull Rings	50, 10&5
Bull Punches	25
Tobacco Needles	20&10
Hammers—Cast Steel	33⅓
Nail Sets	30
Nail Drawers or Box Openers	33⅓
Bright Wire Goods—Iron and Brass	65&10&10
Pen and Pocket Cutlery	25
Erasers	20&10
Tuning Forks—New List	net
Triangles	10
Hoof Cleaners	net

Terms—Cash within 30 days.

Wilson, Wood & Co., Wilmington, Del., have issued the following price list for Wood's Patent Spring Bottoms for Water Coolers and Refrigerators. This list is subject to discount 25 and 5 per cent. for cash in 30 days.

Round for Coolers.

5¼	in. diameter, per doz.	$2·00
6¾	" "	2·25
7	" "	2·50
7¾	" "	2·75
8¾	" "	3·00
9¾	" "	3·50
10¾	" "	4·00

Oblong for Refrigerators.

	Per Doz.		Per Doz.
6x8	$2·50	7x13	$3·50
7x9	2·75	8x13½	4·00
7x10	3·00	9x13½	4·50
7x12	3·25	10x13½	5·00
8x12	3·50	10x15	5·50
9x12	4·00	11x16	6·00
10x12	4·50	12x17	6·50

We have received the following circular:

Benjamin F. Badger respectfully informs his friends and customers that he has this day admitted Benjamin F. Badger, Jr., to an interest in his business, which will hereafter be conducted under the name and style of Benjamin F. Badger & Son. Every effort will be made to deservedly increase the already enviable reputation of this establishment; and novelties in design and style will be added to the present list, from time to time, as the market may require.
CHARLESTOWN, MASS., Feb. 1, 1876.

Bissell, Welles & Millet announce their first spring sale of Heavy and Shelf Hardware, Cutlery, Guns, Files, Shovels, Locks, Mechanics' Tools, and House Furnishing Goods, to take place at their auction rooms, No. 15 Murray street, on Tuesday and Wednesday, Feb. 29 and March 1, commencing at 10·30 a. m. each day. They have also issued the following notice:

PEREMPTORY SALE.

15 Murray street, N. Y., Feb. 4, 1876.

GENTLEMEN: We shall sell at auction, on Tuesday, Feb. 15, at 10½ a. m., at No. 15 Murray street, to close a consignment, about 5000 dozen Handles manufactured by the Greensboro Handle Works, assorted as follows:

600 doz. Axe Handles, assorted grades and lengths; 400 doz. Pick, 1000 doz. Blacksmiths', Carpenters', Machinists' and Hatchet Handles, assorted, 16 to 24 in.; 500 doz. Hatchet, 300 doz. A. E. Hammer, 1200 doz. Sledge Handles, 300 doz. Mallets, 3000 Spokes, assorted sizes.

Bills over $100, 3 months' credit for approved paper. Under $100, cash.

You are respectfully invited to be present.
BISSELL, WELLES & MILLET, Auctioneers.

Edward J. Holden & Co., No. 54 Beekman street, invite the attention of the trade to the American Ice Chisel, which they illustrate in their advertisement on the 6th page. They say of this tool that its use "saves time, ice and damage to refrigerators; it shaves more rapidly than a crusher, and splits as true as a saw." The blades are made from the best English Steel.

The Schierloh Mfg. Co., manufacturers of "Cherry Heat Welding Compound," have an altogether unique advertisement on the 19th page, to which we invite the attention of our readers. This compound is put up in 1, 5, 10, 50 and 100 pound packages, and is kept in stock by a great many hardware dealers throughout the country.

E. M. Boynton gave an exhibition of the cutting powers of his new Centennial Lightning Saw, on Tuesday last, at his warerooms, No. 80 Beekman street. The stick operated upon was a 9½ inch chestnut log. A number of cuts were made with a Cross Cut Saw of the new pattern; the time occupied was about 8 to 10 seconds to each cut. A number of gentlemen assembled to witness the trials, which were very satisfactory. We think this trial demonstrates the fact that the improved tooth, while simplifying the saw in the matter of filing and keeping in order, does not in the slightest degree detract from the high reputation for fast cutting qualities which has made the Lightning Saw a success in the trade.

BRITISH IRON MARKET.

(*Specially reported by cable for The Iron Age.*)

WEDNESDAY, Feb. 9, 1876.

Scotch Pig.—The falling off in demand continues, and but little business is reported. Prices are declining. The following are the quotations for Makers' Irons:

Gartsherrie No. 1	73/6
Coltness No. 1	76/6
Glengarnock No. 1	69/6
Eglinton No. 1	63/6

Manufactured Iron and Rails remain without change to report.

IRON.

American Pig.—Trade appears to have relapsed into the same old dull rut which has characterized the entire Iron interest for so long a period. The few contracts closed last week had the effect of brightening up some of the holders, and a general revival of trade was anticipated; but since then very little has been done beyond the few small parcels taken to supply immediate wants. Some dealers appear disposed to take a hopeful view of the situation, and think the interest shown by some manufacturers last week can be taken as an indication of a better state of affairs in the near future; but, on the other hand, there are plenty of others who claim that there is really very little in the present position of the trade to inspire confidence or warrant any anticipation of an early improvement in values. They admit the light production, but say that with a slight increase in the demand other furnaces, now out of blast, will immediately start in, and thus increase the available supply. How it will be in the future it is, of course, difficult to conjecture, but at the moment, although there is very little pressure to realize among the leading makers, there is a feeling of uncertainty, and the market somewhat irregular in tone. The transactions of the week foot up about 1000 tons in lots, different brands, at $23 for No. 1, and $21 for No. 2. We quote No. 1 at $23, No. 2 at $21 @ $22, and Gray Forge at $20 @ $21.

Scotch Pig.—The advices from abroad are rather less favorable this week, and if any large lots were offering it is probable a reduction would be necessary to move them; but the supply here is small and but little on the way, and with orders confined to small lots, holders are enabled to obtain full former prices. We quote Coltness at $32 @ $33; Glengarnock at $30 @ $31; and Eglinton at $29·50 @ $30·50.

Rails.—The general position of the market for Rails remains much the same as noted in previous issues. The demand is light, and though now and then some little negotiation is spoken of, still it seldom amounts to anything of importance. Few of the railroads are in a position to offer early cash, even if in want of supplies, and the majority of the corporations are disposed to pursue an economical policy. Steel Rail makers are fairly occupied in filling former contracts. We quote, nominally, $42 @ $46, currency, for American at the mills.

Old Rails.—Trade in Old Rails continues exceedingly slow, and though the prices asked are high in comparison to some of the late sales, it is thought a prompt bid at the lower figure would quickly procure stock. A sale is spoken of on the street of about 200 tons, but is not confirmed. We quote, nominally, at $21 @ $22.

Scrap.—The demand for Scrap Iron continues very dull and uncertain, and the value, though held steadily, must be considered as more or less nominal. We quote at about $30 for No. 1.

METALS.

Copper.—If we are to believe the reports reaching us of the great purchase for the French government, which we alluded to in late issues of ours as impending among us, has been consummated—say 8,000,000 pounds Lake Superior, we presume at 21c., to be shipped between now and mid-summer—it would seem that the transaction has been direct between the military authorities over there, through their representatives here, and the agents of the leading mine or mines. The assurance that this purchase had been made came in such a positive form that the market gained in tone since, with some prospect of an improvement. Aside from this negotiation, there have been sold between 250,000 and 300,000 pounds Lake Superior at 22½c. @ 22¾c., the quotation at the close being the outside figure. We nominally quote Baltimore 23c. About futures there is too much hesitation on the part of both buyers and sellers to lead to any business. At London a decline is reported. On Saturday, Chili Bars stood £80. 10/, reported by cable since, £80. Best Selected had declined to £87. 10/. Mail accounts from there are to the 22d inst., when the West Coast charters for the first half of January had been cabled to be 1500 tons, while the actual export from Chili in December had been 2500 tons. According to this, Chili exported last year altogether, 48,000 tons fine, against 48,240, 42,165, 46,337 and 41,200 the previous four years. The greatest export year was 1869, when 54,867 tons were shipped. The average for the ten years from 1866 to 1875 inclusive, was 46,309. This shows great steadiness. Production in England during 1875, is estimated to have been 4500 tons fine, against 4981, 5240, 5703 and 6280 the previous four years. In 1866 the production was 11,153 tons. The average for the ten years was 7337 tons, showing an uninterrupted decrease. The manufactures of Copper are sustained in value as follows: New Sheathing, 30c.; Bolts and Braziers, 31c.; Nails 38c. @ 39c.; Bronze and Yellow Metal Sheathing, 21c.; Yellow Metal Bolts, 28c.; and do. Nails, 21c., net cash.

Tin.—Several incorrect telegraphic quotations have been current during the week. At one time Straits Tin was represented as being worth £83 at London, and the ensuing day it was reported to command only £79 @ £79. 10/. The real quotation, as per dispatches to hand to-day, has all along been £81. 10/, while Singapore simultaneously showed the same steadiness at $22·75. The fact is that some of the parties most heavily interested in the immediate future of the metal seem to be hard up for some excitement both in Europe and elsewhere, and in the absence of any material for it the fanciful cable quotations alluded to are set afloat. As the metal is situated it will be more exclusively ruled by the next Straits and Australian monthly shipments than by anything else. We are quiet here. In large lots Straits would not bring over 18¾c., gold, nor L. and F. above 18c., gold. We quote, in gold, for moderate sized parcels, as follows: Straits, 18⅛c.; English Refined, 18⅛c. @ 18¾c.; L. & F., 18¼c., and Banca, 22½c. @ 23c. Tin Plates have remained as quiet as heretofore; we quote large lots, ordinary brands, gold, per box, as follows: Charcoal Bright, $7·50 @ $7·62½; ditto Terne, $7 @ $7·25; Coke Tin, $6·62½, and ditto Terne, $6·12½ @ $6·35. Great Britain exported in 1875 2,448,986 boxes, against 2,143,468, 2,153,477 and 2,083,451 the previous three years. Out of these amounts there were shipped to the United States alone 1,673,435, against 1,585,994, 1,511,632 and 1,531,356. Interruption of work by strikes and losing prices abroad have not had the effect of checking the general export in the least; on the contrary, it has been larger than ever. We note a considerable decrease, however, in the import in January into our port, which has amounted to but 68,224 boxes, against 162,929 in 1875.

Lead.—Nothing of special interest has occurred in this metal, the dealings amounting in the aggregate to but about 75 tons Common Domestic at 6c., gold, at which the market remains firm at the close. Soft Missouri, at St. Louis, is worth 7c., currency, as heretofore; freight to New York, 58c. Europe, though inactive, reports a steadier market. The manufactures of Lead are firm at the following rates: Bar, 8¾c.; Pipe, 9c.; and Sheet, 9½c., less 10 per cent. to the trade.

Spelter and Zinc.—Domestic Spelter is reported firm at 7¾c., currency, less the discount, the new combination figure; yet there has been once more some underselling by outside parties in moderate lots at rates not easily ascertained. Foreign remains inactive, but steady. No sales are reported. We quote, nominally, 7·30c. @ 7·40c., gold, according to brand. In England the available supply has dwindled down very much; at Hamburg there is none, and at Breslau any new output is disposed of at once, both on the spot and for future delivery. Under these circumstances there is some prospect for a further advance, should the French demand develop on as extensive a scale for the spring trade as it will be remembered took place a year ago. Sheet Zinc dull and nominal at 8¾c. @ 9c., gold.

Antimony.—There is no difficulty in realizing 14½c., gold, for good brands. A moderate trade is transacting.

IMPORTATIONS.

Of Hardware, Iron, Steel and Metals into the Port of New York, for the week ending Feb. 8, 1876:

Hardware.

Boker Hermann & Co.
Ironware, cks., 5
Chains, cks., 19
Bamberger & Oppenheimer.
Cases, 10
Frasse P. A. & Co.
Mdse. pkgs., 1
Field A. & Co.
Mdse. pkgs., 7
Fuller Bros.
Anvils, cks., 64
Spades, bdls., 6
Hammers, cs., 2
Cutlery, cs., 1
Coil chains, 12
Traces, cks., 21
Hardware, cks., 7
Sheep shears, cks., 1
Laughland & Co
Wire, pkgs., 20
Peters Bros.
Steelware, cs., 4
Rosenthal J. & Co.
Ironware, cs., 5
Schuyler, Hartley & Graham.
Gun wads, cs., 8
Gun caps, cs., 8
Thompson, Langdon & Co.
Cases, 5
Wiebusch & Hilger Mfg. Co.
Cases, 4
Ironware, pkgs., 13
Order.
Cases, 10
Files, cks., 32

Iron.

Holden, Hopkins & Stokes,
Teazle, bdls., 134
Henderson Bros.
Pig, tons, 200
Laughland & Co.
Hoybands, bdls., 365

Steel.

Crabb Wm.
Wire, bdls., 37
Frith Edward.
Cases, 7
Naylor & Co.
Tires, 12
Prosser Thos. & Sons,
Tire forgings, 38
Pieces, 28
Bars, cs., 1
Seddons R.
Cases, 14
Casks, 2
Sulzbacher & Hyman,
Cases, 11
Packages, 21
Pieces, 2
Stakes, 227
Woodford W. O.
Cases, 12
Bundles, 8
Order.
Cases, 2
Bundles, 37

Metals.

Bartram Bros.
Copper, bdls., 3
Scrap, bdls., 1; bbls., 2
Copper, ½ bbl.
Byrne Joseph & Co.
Tin plates, bxs., 1359
Bruce & Cook,
Tin plates, bxs., 1611
Phelps, Dodge & Co.
Tin, ingots, 600
Tin plates, bxs., 800
Scheider J. & Co.
Tin plates, bxs., 295
Order,
Tin plates, bxs., 725

OLD METALS, PAPER STOCK, &c.

We have no perceptible improvement to report in the condition of the Old Metal market. Dealers have been selling them more freely than for some time past, but yet there is no active demand. The Rag and Paper Stock markets remain unchanged. Gunny Bagging is in good request and scarce in the market, but not sufficiently so to alter prices. We quote the following as the current purchasing rates:

Old Metals.—Copper, 16c. @ 17c. per lb.; Yellow Metal, 11c.; Brass, 10c. @ 2c.; Composition, heavy, 13c. @ 14c.; Lead, solid, 5½c.; Tea Lead, 5c.; Zinc, 4¼c. @ 4½c.; Pewter, No. 1, 16c.; do., No. 2, 8c. @ 12c.; Spelter, 5¼c., Wrought Iron, $27 per ton; Light do., $14 per ton; Stove Plate, $12 per ton; Machinery, do., $14 per ton.

Rags, &c.—Canvas, Linen, 4¾c. @ 5¼c.; do. Cotton, No 1, 5¾c. @ 6¼c.; No. 2, 2¼c.; White, No. 1, 5¾c.; No. 2, 4c.; Colored, do., 2c. @ 2½c.; Mixed, Woolen, 2c. @ 3c.; Soft, do., 5c. @ 5½c.; Gunny Bagging, 1¼c.; Jute Butts, 1¾c. @ 2c.; Kentucky Bagging, 3c.; Book Stock, 3c.; Waste Paper and Scraps, 1¼c.; Kentucky Bale Rope, 4c.; Oakum Junk, No 1, 4½ @ 5c.; do. No. 2, 3c.; Tarred Shaking, 1c. @ 1¼c.; Grass Rope, 2¾c. @ 3c.

COAL.

The Coal companies at a conference held recently in this city unanimously concluded to stop work at the mines throughout the whole Anthracite Coal region in Pennsylvania, and to suspend the further transportation of Coal until March 11th. The reason assigned for the total suspension of mining and transportation is that, in consequence of the unusually warm winter, there is more than enough Coal already in the market to supply all the demand that is likely to be made for the remainder of this month and almost half through the month of March. No new arrangement has yet been made in regard to prices.

The following will be the prices of the Lehigh & Wilkes-Barre Coal Company's coal, delivered f. o. b. at Port Johnston, N. J., between the 1st of February and the 1st of March next. The company reserve the right to change same at any time, except on contracts made prior to such variations:

	Lump.	Steam.	Broken.	Egg.	Stove.	Chest.	Chest't No. 2.
	$	$	$	$	$	$	$
Old Co.'s Summit	5 25	....	4 90	5 00	5 50	4 85	3 75
H. B. L.	5 25	....	4 90	5 00	5 50	4 85	3 75
Wilkes-Barre	4 65	4 65	4 75	4 95	5 50	4 70	3 75
P. R. A., net	....	....	4 75	4 95	5 50	4 70	3 75

We quote as follows: Anthracite, $4·85 to $5·50; Cumberland, $6·25 @ $6·75; West Vir-

ginia, $6·75; James River Steam, $6·25; James River Carbonite, $9 @ $9·50; Kanawha House, $11·50; American Gas, $6·75 @ $7·25; American Cannel, $12 @ $14; Pennsylvania and Westmoreland, $6·75; Newburgh Oirel, $6·50; Sterling Ohio, $10; Ince Hall, $17 @ $18; Liverpool House Cannel, $17; Liverpool Gas, $12; Newcastle Gas, $7; Scotch, $6·50 @ $7.

The Coal transported over the Cumberland Branch Railroad during the week ending Feb. 5, 1876, amounted to 337 tons, as against 73 tons shipped in the corresponding period of last year, showing an increase of 264 tons. Over the Cumberland & Pennsylvania Railroad, for the same period, the shipments were 14,876 tons, against 15,299 tons shipped in 1875; a decrease of 423 tons. The aggregate amount of Cumberland Coal shipped by the various companies so far this year amounts to 94,966 tons.

PHILADELPHIA.

Office of *The Iron Age*, 230 South Fourth St., PHILADELPHIA, Feb. 8, 1876.

PIG IRON.—Business is extremely quiet, and though there are numerous inquiries from various sources, the actual business so far is very limited. Prices are steady, however, and there is no disposition to force sales by lowering quotations, as it is felt that the demand is likely to be quite equal to production, so long as prices remain at present low rates. The sales for the week aggregate about 5000 tons, at about $23 for No. 1 Foundry, $21 for No. 2 Foundry and $20 50 to $22 for Gray Forge.

BARS.—The trade is very quiet and prices weak. Sales to a fair extent of ordinary lots at 2·35c. from store. The best brands still bring 2·5c., at which rate 150 tons have been sold the past few days.

RAILS.—Inquiries are still numerous, but actual business so far this week has been very limited, amounting in all to only a few hundred tons, at a fraction under $65, at which price the market is quiet and steady. A considerable amount of Rails are changing hands, Old Rails being taken in part payment. It is difficult, therefore, to give cash quotations, but buyers would be able to obtain some concessions on our late quotations of $65 to $67 for Steel Rails and $42 to $45 for Iron Rails.

OLD RAILS.—The market is quiet and steady at $22·50 to $23 50. Sales of several hundred tons are reported within the range of our quotations.

SCRAP.—There is more inquiry, but prices are very various, and it is difficult to give quotations. $16 to $19 is about the range for Cast, $22 to $23 for Light Wrought and $27 to $29 for select lots.

NAILS.—No change in quotations. The local demand is fair, but sales are mostly in small lots at $2·85 to $3. Buyers of large parcels can supply themselves at somewhat lower rates.

TIN PLATES.—No change to note. The demand is steady at $8·50, currency, for Charcoal Bright; Terne, $8; Coke Tin, $7·35; Coke Terne, $7.

PITTSBURGH.

PITTSBURGH, Feb. 8, 1876.

PIG IRON.—There has been a fair degree of activity during the past week, but the demand was chiefly for small lots to supply immediate wants, and, while prices are fully sustained, the general tone of the market does not appear to be as strong as it was last month. The mills, as a rule, are refusing to anticipate future wants; there was nothing made by it last year or the year before that again, and mill owners can see no inducement to stock up. They will continue to buy along as they need it—to adhere to the hand-to-mouth policy. Quotations may be fairly given as follows: Bituminous Coal Smelted, No. 1 Foundry, $25 to $26, 4 months; No. 2, $23 to $24; Gray Forge, $22 to $22·50; White and Mottled, $20 to $21; Hanging Rock Charcoal, No. 1 Foundry, $36 to $38; No. 2, $24 to $26; Gray Forge, $22·50 to $23; Cold Blast Car Wheel, $45 to $50.

MANUFACTURED IRON.—Trade is picking up. Orders have commenced to come forward pretty freely, and nearly if not all the mills are in operation, although but few of them are working double turn. Manufacturers do not anticipate any dearth of orders; there is no cause for complaint in this respect, but it is complained that prices are unremunerative—that they have been cut to such an extent, as to leave little or no margin for profit. Merchant Bars quoted at 2·15c. to 2·25c., 60 days.

NAILS.—Orders have commenced to come forward pretty freely, and some makers report that by shading current rates they could fill their books with orders. We continue to quote at $2·65, 60 days, although it is rumored that sales are being made below quotations. Wheeling, it is alleged, continues to cut prices.

HORSE SHOES.—There is a fair demand, but no change to note in prices; Shoenberger & Co. continue to quote at 4¾c., cash; Mule Shoes, 5¾c.

STEEL RAILS.—Trade continues to keep very well. The Edgar Thompson Company report that they have orders enough booked to absorb their production until July, single turn. Prices reported easier, but unchanged; $65, cash, delivered free on cars in Pittsburgh.

WINDOW GLASS.—The Pittsburgh manufacturers have adopted a new card, which has reduced the rates nearly one-half, as compared with the old list, and discounts have been reduced correspondingly. Discounts off old list, 75 and 10 to 80; off new one, 40 and 10. Nearly all the factories are in operation, the blowers having accepted the reduction of 10 per cent.

The Pittsburgh *Commercial*, of the 5th inst., says: The market for Pig Metal this week has been very quiet and transactions limited to a few small lots, with no change in price. Holders are firm at prices quoted below. We are reported the following sales:

BITUMINOUS COAL SMELTED FROM LAKE SUPERIOR ORE.

300 tons No. 2 foundry	$24·00—4 mos.
200 tons gray forge, r. s.	22·50—4 mos.
200 tons gray forge, r. s.	21·00—cash.
100 tons gray forge, r. s.	22·50—4 mos.
100 tons gray forge	22·50—4 mos.
100 tons mottled and close gray.	21·50—4 mos.

CONNELLSVILLE COKE.

200 tons close white mottled.	$20·00—cash.
100 tons gray forge	22·00—4 mos.
20 tons No. 2 foundry	23·00—cash.

ANTHRACITE.

200 tons gray forge	$21·50—4 mos.
100 tons No. 1 foundry	25·00—4 mos.

CHARCOAL.

10 tons No. 2 foundry, H. R.	$35·00—4 mos.

BLOOMS.

20 tons charcoal	$65·00—4 mos.

BALTIMORE.

Messrs. WYETH & BROTHER, Iron and Steel merchants, South Charles and Lombard streets, report us the following prices under date of Feb. 8: We continue to report a dull and depressed market, with but little metal moving. The most noticeable feature for the past week has been a decline in Perkins' Horse Shoes of ½c. per pound. With this exception the list remains unchanged.

AMERICAN REFINED BAR IRON.

1 to 6 wide by ¾ to 1 thick.. } 1 to 4½ wide by 1½ to 2 thick }	2 4-10 to 2 5-10c. ₱ lb.
Round and square, ordinary sizes, from ¾ to 2 inclusive	2 4-10 to 2 5-10c. "
Hoop Iron, 1½ wide and upward	3¾ to 4c. "
Band Iron, from 1¾ to 4 in. wide	3 to 3¾c. "
Horse Shoe Iron ¾ to 1 wide by ¾ to ¼ thick	3¾ to 4c. "
Norway Nail Rods	7 to 7¼c. "
Black Diamond Cast Steel, Flats, Squares and Octagon, ordinary sizes	15 to 15½c. "
Machinery Steel	10 to 11c. "
Cast Spring Steel	9 to 9½c. "
Homogeneous Steel Plate	9¼ to 10c. "
Perkins' Horse Shoes, per keg of 100 lbs.	$4·62½
" Mule Shoes " "	5·62½

Common Horse Nails, from 14c. to 18c. per pound.

	10	9	8	7	6	
Putnam Horse Nails	23	24	25	26	28c.	per lb.
	10	9	8	7	6	
Globe Horse Nails	23	24	25	26	28c.	per lb.

R. R. Spikes 2¾ to 3c.

Messrs. R. C. HOFFMAN & Co., Iron and commission merchants, Nos. 23 and 25 South Frederick street, report the Pig Iron market as follows, under date of Feb. 8: We have no change to note in the Iron market since our last report. The sales are at quotations.

Baltimore Charcoal	$32·00 @ 35·00
Virginia "	28·00 @ 34·00
Anthracite No. 1	24·00 @ 25·00
" No. 2	22·00 @ 23·00
" No. 3	21·00 @ 22·00
White and Mottled	18·00 @ 20·00

CINCINNATI.

Messrs. L. R. HULL & Co., under date of Feb. 5, write us as follows: PIG IRON.—The market has been more active for both Foundry and Mill Irons, and a considerable amount of neutral in the aggregate has changed hands. The quotations as below are unchanged.

HOT BLAST CHARCOAL.

Hanging Rock No. 1	₱ ton. $25·00 @	—4 mos.
" " No. 2	23·00 @	—4 mos.
" " Forge	21·00 @ 22·00	—4 mos.
Southern Brands No. 1	23·00 @ 24·00	—4 mos.
" Forge	21·00 @	—4 mos.
Virginia No. 1	24·00 @ 25·00	—4 mos.
" No. 2	22·50 @ 23·00	—4 mos.
" Forge	21·00 @ 22·00	—4 mos.

HOT BLAST STONE COAL AND COKE.

Hanging Rock No. 1	₱ ton. $23·00 @	—4 mos.
" " Forge	21·00 @	—4 mos.
Red Short No. 1	27·00 @	—4 mos.
" Forge	24·00 @	—4 mos.
Am. Scotch, No. 1	24·00 @ 25 00	—4 mos.

COLD BLAST CHARCOAL.

Hanging Rock Car Wheel	₱ tn. $40·00 @ 50 00	—4 mos.
Missouri " "	35·00 @ 40·00	—4 mos.
Southern Br'ds " "	30·00 @ 40·00	—4 mos.
Machinery and Forge	30·00 @ 35·00	—4 mos.
Blooms	@	—4 mos.

ST. LOUIS.

Messrs. SPOONER & COLLINS, Iron commission agents, 409 North Third street, St. Louis, under date of Feb. 3, report the Iron market as follows: We report no change in our market. Both demand and price continue light and low, but little is being done at our mills or foundries, and the trade is looking very blue. We quote on 4 mos. time.

Mo. Stone Coal, No. 1 F'dry.	$25·00 @ 26·00	—4 mos.
" " No. 2 F'dry.	24·00 @ 25·00	—4 mos.
" " Gray Mill	24·00 @ 25·00	—4 mos.
" Charcoal, No. 1 F'dry	24·00 @ 25·00	—4 mos.
" " No. 2 F'dry	23·50 @ 24·00	—4 mos.
" " Gray Mill	23·00 @ 24·00	—4 mos.
Tenn. Charcoal No. 1 F'dry	24·00 @ 25·00	—4 mos.
" " No. 2 F'dry	23·00 @ 24·00	—4 mos.
" " Gray Mill	23·00 @ 24·00	—4 mos.
Va. Coke Iron No. 1 F'dry	25·00 @ 26·00	—4 mos.
" " No. 2 F'dry.	24·00 @ 25·00	—4 mos.
" " Gray Mill	23·50 @ 24·50	—4 mos.
H. R. Charcoal No. 1 F'dry	26·00 @ 27·00	—4 mos.
H. R. " No. 2 F'dry	24·00 @ 25·00	—4 mos.
H. R. " Gray Mill	24·00 @ 25·00	—4 mos.
Massillon Iron, A, No. 1	31·00 @ 32·00	—4 mos.
" " B, No. 1	29·00 @ 30·00	—4 mos.
" " No. 3	27·00 @ 28·00	—4 mos.
Cold Blast Car Wheel, Mo.	35·00 @ 40·00	—4 mos.
" " Tenn.	33·00 @ 35·00	—4 mos.
" " Ala.	33·00 @ 35·00	—4 mos.
" " Hanging Rock	32·00 @ 33·00	—4 mos.
Mo. Charcoal Blooms	60·00 @ 70·00	—4 mos.
" Scrap "	55·00 @ 60·00	—4 mos.
Mo. Charcoal Hammered Billets	75 00 @ 80·00	—4 mos.
Assorted Bar Iron	@ 2·35—90	dys.
No. 1 Wrought Scrap	1·10 @ 1·25	—cash.
Heavy Cast "	·75 @ ·95	—cash.
Light Cast "	·50 @ ·60	—cash.

BOSTON.

FEB. 5.—*Pig* is very dull, the little work the foundries are doing seeming to be filled in with lots bought previously. The quotations range from $19 to $28 on all grades, and these figures are simply nominal indexes. *Bar* has had a fair jobbing trade, but at a still lower basis, the general quotation this week being $50, a decline of $1·50 on our last reports. This has not been another sudden turn to values, but it has for a week been an occasional price, and on which our remarks of the case at $51·50 have been predicated. At the point at which sales are now making, $50, there is no visible strength. This is $5 a ton lower than New York city dealers bill at, and $3 a ton under Philadelphia. It is fully $2 a ton less than any known private quotations for mills can show the stocks can be replaced at, and still iron is sold and iron comes in. Our reports may possibly conflict with the business in other cities, and create no little anxiety at the producing points; but as business is coming here from distant localities never heretofore reached by the Boston market, the trade probably know just what they are doing. It may be a question of time as to how long this demoralization on values will continue, but while it holds out buyers cannot be very far from security in taking all they want. Common iron is wholly nominal; $45 is a quotation, but it is simply a guess. You can tell best what you can do in this grade when you make an offer. *Steel* is having a very light, and yet a steady business just now, scattering through all the different lines. We quote: American Tool, 14c. to 15c.; American Machinery, 9c. to 9½c.; Bessemer Tires, 6¾c. to 7¼c.; Sweet's Excelsior Tire, 8½c. to 12c.; English Tool, 17c. to 18c., gold. *Copper* is decidedly easy, and although the combination make no reductions in quotations, those who advanced the wherewith to sustain the control have reduced their margins 1c. a pound, and urge a cessation of production. We quote 23c. to 23¾c., for spots or futures. For manufactures we quote: New Sheathing, 30c.; Bolts and Braziers, 31c.; Yellow Metal Bolts, 20c. to 23c. *Lead* is steady with the stock moderate and the demand light. We quote Pig 6c. for Domestic, and 6⅝c. to 6½c. for Foreign; Sheet and Pipe Lead, 9c., currency; Tin Lined Pipe, 16½c.; Bar Lead, 9c., less usual trade or 10 per cent. discount. *Antimony* is firm, with a small inquiry at 13½c. *Spelter* is strong and quiet at $7·45, 30 days, and $7·35, prompt cash, all currency. Silesian is dull at $7·75. *Tin* is lower this week. The demand is trivial, especially for pig, which seems to be without much confidence. Plates are very irregular and sales are making below the cost to import. We quote: Straits, 19c; Banca, 23c.; Refined English, 18½c. to 19c; gold. We quote Plates: Charcoal I.C., $7·50; Coke, $6·75 to $7; and Terne at $6·30 to $6·75, gold.—*Com. Bulletin.*

LOUISVILLE.

Messrs. GEO. H. HULL & Co., under date of Feb. 7, writes us as follows: The market is dull, but without changes in price. The usual time, four months, is allowed on the quotations below:

HOT BLAST CHARCOAL.

No. 1 F'dry, from Hanging Rock Ores	$25·00 @ 26·00
" 2 " " " "	23·00 @ 24·00
" 1 Mill, " " "	—@—
" 1 F'dry, from Alabama, Georgia and Tennessee Ores	23·00 @ 24·00
" 2 F'dry, from Alabama, Georgia and Tennessee Ores	22·00 @ 23·00
" 1 Mill, from Alabama, Georgia and Tennessee Ores	21·00 @ 22·00

HOT BLAST STONE COAL AND COKE.

No. 1 F'dry, from Hanging Rock Ores	$23·00 @ 24·00
" 2 " " " "	22·00 @ 23·00
" 1 Mill, " " "	21·00 @ 22·00
" 1 F'dry, from Alabama, Georgia and Tennessee Ores	23·00 @ 24·00
" 2 F'dry, from Alabama, Georgia and Tennessee Ores	22·00 @ 23·00
" 1 Mill, from Alabama, Georgia and Tennessee Ores	21·00 @ 22·00
No. 1 F dry, from Missouri Ores	24·00 @ 25·00
" 2 " " "	24·00 @ 25·00
" 1 Mill, " " "	25·00 @ 26·00

COLD BLAST CHARCOAL.

Car Wheel from Hanging Rock Ores	35·00 @ 40·00
" " Tennessee Ores	28·00 @ 30·00
" " Alabama and Georgia Ores	28·00 @ 38·00
Car Wheel from Kentucky Ores	28·00 @ 40·00

CLEVELAND.

Messrs. C. E. BINGHAM & Co., 25 West Main street, under date of Feb. 7, quote the Iron market as follows, 4 mos. time:

FOUNDRY IRON.

No. 1 Lake Superior Charcoal	$28·50—4 m.
No. 2 " "	28 00—4 m.
No. 1 Anthracite	26·00—4 m.
No. 2 "	24·50—4 m.
No. 1 Bituminous	26·00—4 m.
No. 2 "	24·50—4 m.
No. 1, Cherry Valley Am. Scotch	29·50—4 m.
B—1 " "	27·50—4 m.
No. 2, " "	26·00—4 m.
No. 1 Massillon	28·00—4 m.
B—1	26·00—4 m.
No. 2	23·00—4 m.

CAR WHEEL AND MALLEABLE IRON.

No. 3 Lake Superior Charcoal	$27·50—4 m.
No. 4 " "	28·00—4 m.
Nos. 5 & 6 " "	29·00—4 m.

BESSEMER IRON.

Nos. 1 and 2 Lake Superior Charcoal	$28·00—4 m.

FORGE IRON.

No. 1 Gray	$23 00—4 m.
White and Mottled	22·00—4 m.

RICHMOND.

Mr. ASA SNYDER, Iron Merchant and Furnace Agent, Richmond, Va., writes as follows under date of Feb. 7: Last week's figures are well maintained for all descriptions of Pig Iron. The best brands of Charcoal Iron are very firm, and commands my highest quotation.

Virginia cold blast Charcoal Pig Irons (according to brand)	$27·00 @ 33·00
Virginia hot blast Charcoal Pig Irons (according to brand)	24·00 @ 28·00
Va. hot blast Coke Pig Iron, No. 1 ex.	23·00 @ 24·00
" " " " No. 2 ex.	21·00 @ 22·00
" " " " No. 3 ex.	20·00 @
Virginia Anthracite. No. 1 ex	24·00 @ 25·00
" " No. 2 ex	22·00 @ 23·00
" " No. 3 ex	21·00 @ 22·00

FOREIGN.

FRANCE.

(Moniteur des Interets Materiels).

PARIS, Jan. 23, 1876.—*Metals.*—The European metal trade is still carried on with a great deal of caution, little inclination being shown to extend operations, or to speculate to any great extent. A fair legitimate trade is nevertheless doing; the profits made may be moderate, but the exposure to severe losses is also lessened, and the result is a more satisfactory one than has generally been the case last year and the preceding one. Money is tending toward greater ease. *Copper.*—This metal has given signs of increased steadiness except in this market, where it is weak. We quote, deliverable at Havre, Chili Bars, 212·50; Common do., 210; Ingots, 220; English Tough Cake, 220, and pure Corocoro Ore, 212·50. Nothing transpires at Havre, where first brands are bringing 215; good current, 212·50, and Lota and Urmeneta, 210, all the 100 kilos. Week's arrivals 2872 Ingots and 120 slabs. Copper remains quiet at Marseilles, notwithstanding the favorable statistical position. The following are the quotations in that market: Tokat, 210; small Ingots, 215; round do., 250; Sheathing, 240, and Yellow Metal do., 210 to 215; all with 3 per cent. discount. *Tin* is generally stiffer, and there is more doing in most of the leading markets. Much will depend on the January shipments from Australia and the Straits. Meanwhile a favorable result is expected at the impending Dutch sale. Here we have slightly given way; we quote Banca, deliverable at Havre or Paris, 220; Straits, 215, and English, at Havre or Rouen, 210. At Marseilles Tin has declined about 10 francs the 100 kilos during the past three weeks. They quote Straits, 210; Billiton, 205; and English, 215 to 220. A less active demand is observable for *Lead*, and prices are weaker. We are, however, unaltered here, and quote French, deliverable at Paris, 57·50 francs; Spanish, at Havre, 57; and English there, 57·50. Soft Lead at Havre is bringing 56·50. At Marseilles Lead is bearing up well, but the dealings have not been large. The smelting works are firm in their demands, and nothing can be had under 53 francs. The tendency in the *Spelter* market remains a favorable one, although there is less transacting; but this is due merely to the difficulties which beset shipments during the present severe winter season. Great strength in the metal prevails in our own market. We quote Silesian, deliverable at Havre, 67·25; other good brands there and here, 65·75. At Havre Silesian is quoted 67 francs the 100 kilos. Marseilles reports no change. *Iron.*—The output in France has been rather on the decrease since the beginning of the year. As the spring season usually brings a goodly number of orders, it is expected with hopefulness. Although little is doing here, Merchant Iron remains at 180 francs. At the North prices are nominally sustained, but susceptible of some shading, we presume. It is to be hoped, however, that a serious decline may be prevented. Pig Iron is quite irregular and difficult to quote. At the East the range is between 60 and 70 francs. *Coal* remains, on the whole, tolerably steady. Little has been done in the Pas de Calais, owing to the elections. The Loire is steady, despite the suffering Iron industry. We beg to remark, from a general point of view, that Coal has now arrived at a level where great fluctuations in either direction are out of the question. It is too cheap to decline much, and the iron trade is too dull to create much of an upward movement.

BELGIUM.

(Revue Universelle).

BRUSSELS, Jan. 23, 1876.—*Iron.*—Nothing of a decidedly favorable nature can as yet be reported regarding the iron situation in Belgium. Great quiet still prevails, and there are no signs of a speedy amelioration. We usually receive our impulse from England, where hesitation seems at present the order of the day. But it is not Iron alone which is stagnant, Steel, too, begins to be unfavorably affected, and even at Sheffield, the great Bessemer center, some extensive Rail mills will soon suspend operations. The fact is that Steel production has of late years been equally as much overdone. Under these circumstances we recommend to our Rail mill proprietors to be on the look out for any new railroad lines which will require to be furnished in the immediate future, such as the Siberia-European line from Kasan to Ekaterinburg, Kamishlor, Tumen and Artamovka; the Seville-Huelva road in Spain; the Palermo-Trapani line in Italy, and the Russian extension lines. Those of our Rail makers, relying on the government demand for its State Line alone, have but a poor prospect ahead, and we, therefore, recommend them to foster relations abroad. For Portugal 3000 tons Belgian Rails were taken by a German establishment quite recently. *Coal.*—The strike in the central district seems to be nearly ended, for daily a great many miners resume work; this week alone, 600. The strikers begin to perceive that they had been misled into listening to the disastrous counsels of men who either misunderstood the true relations between the companies and their employes, or merely came from neighboring countries for the sake of mischief, in bringing about which they hoped to forward their own interests. While these strikes lasted, production was diminished considerably, and it is to be hoped that next week all our districts will be once more producing in full.

GERMANY.

(Borsenhalle).

HAMBURG, Jan. 22, 1876.—*Metals.*—But few larger transactions in any of the metals have thus far taken place in the German markets since the commencement of the year. *Copper.*—Business has been almost altogether restricted to filling local requirements. Although the general outlook is by no means discouraging, prices are not firm. Berlin is quiet; good sorts English and Austral au are quoted there 89 to 91·50 the 50 kilos. Stettin remains unaltered at 99 to 100 marks. Here, Droutheim continues to be offered at 92, while Best Selected is 87; Minnesota, 110, and Quincy, 98 marks. Weakness is the prevailing characteristic of our *Tin* markets. At Berlin, Banca commands 90 to 90·50, and English 87 to 87·50 the 50 kilos. Here, some 30,000 pounds have been offered for sale at auction without meeting with a bid. The German *Lead* markets have been better sustained than those of neighboring countries. Berlin is steady at 22·25 to 24 marks the 50 kilos for Tarnowitz, Hartz and Saxonian. Stettin is firm at 27 for Spanish, and 25 German. Here, 14,000 pounds Spanish have brought 23·25. We quote German 24 to 24·50, and English Pig, 24 to 24·50. *Spelter.*—The metal fully maintains its firm attitude in our markets, and there is no abatement from the figure 24·75 to 25·75 at Berlin. The available stock both at Breslau and here is now so much reduced that business in the metal has been restricted to a mere trifle.

HOLLAND.

(Koch & Vherboom).

ROTTERDAM, Jan. 18, 1876.—*Tin.*—The market remains quiet, and the dealings are limited to supplying immediate, pressing local requirements. Sales from the impending sale have been effected of Banca Tin at 49 to 48¾ guilders. Most of our consumers are content to await the result of the coming auction. The transactions in Billiton Tin are insignificant.

EAST INDIES.

(Dummler & Co.)

BATAVIA, JAVA, Dec. 18, 1875.—*Tin.*—The 10,000 piculs Billiton offered on the 13th instant were sold at 12·6 guilders per picul on an average. *Coal.*—Two cargoes were recently sold; Welsh at 18, 3 months, and Scotch at 12·50, 6 months; also West Hartley at 21. There are some more cargoes on the market without finding purchasers so far. *Freights.*—Considering the advanced state of the shipping season—the quantity of available tonnage is quite large—shipmasters have consequently met with more or less difficulty in fixing their vessels at reasonable freights; at all events, they have not been able to obtain former rates. *Exchange.*—The tendency has been invariably in favor of sellers. We quote London, 6 months' sight, 11·72½ to 11·77½ the £, private bills.

(Aitken, Spence & Co.)

COLOMBO, Ceylon, Dec. 23, 1875.—*Plumbago.*—Small purchases have been made lately of the lesser sizes, at our quotations, which are firmly maintained by dealers. Supplies of Chips and Dust are extremely limited in face of the small demand for Lump. Dec. 29.—Nothing of importance doing at present. We quote, free on board, without freight, exchange at par, cleaned, including packages and duty, Lump, 310/; Chip, 170/, and Dust, 120/. Freight to New York, 70/, with a moderate business doing. There have been shipped to the United States, since Oct. 1, 21,737 cwts., against 3116 in 1874; to England, 12,209; Marseilles, 111, and Trieste, 362, while to Australia 200 cwts. have gone, making the total thus far this year 34,620 cwts. The Killarney 432 tons, has been taken up for New York at 60/, all round, and is now loading. Exchange, 1/10½, nominally.

(Gilfillan, Wood & Co.)

SINGAPORE, Dec. 15, 1875.—*Tin.*—The market has continued steady at $23 per picul, at which all the ordinary Malacca offering has been taken up. At closing the feeling is rather weaker. *Shipping.*—There is a fair supply of vessels, and rates are unchanged. The Hera has been laid on for New York at 25/ for Tin. The steamer Gordon Castle is expected from China shortly en route for New York. The St. Bernhard, for New York, took 840 piculs, and the steamer Loire, via London, 499. No charters for Boston. The Douglas Castle still loading. *Exchange* has declined to 4/1⅛ to 4/1⅛, 6 months' London.

(Sandilands, Buttery & Co.)

PENANG, Dec. 18, 1875.—*Tin.*—The market opened with small transactions for Europe at $22 per picul for unsmelted, which were followed by purchases for China and India at prices ranging from $22·40 to $22·60. Lower quotations from home caused, however, a decline to $22·10 to $22·05, and only after departure of last mail, when a better demand for Europe set in, rates hardened again, and fair purchases have been made at $22·40 to $22·50. The market closes weaker at $22·30. Stocks in the bazaar aggregate 5000 piculs. The Fleurs Castle, for New York, took 1828 piculs. *Exchange* has given way to 4/1¾ to 4/1⅝.

Our English Letter.

Review of the British Iron, Steel, Metal and Hardware Trades.

(From our Regular Correspondent.)

SHEFFIELD, ENG., Jan. 24, 1876.

THE STATE OF TRADE

has varied very little during the past few weeks, and, as a general rule, is quite as dull as it was during the first part of December. In the last two or three weeks of the past year there was, as I reported at the time, a little irregular and spasmodic activity, owing to then existing desire to clear off all orders prior to the incoming of the new year. In every direction the finished iron departments remain in a greatly depressed condition, and the state of the order books of most of the manufacturers is such at present as forbids any hope of an early improvement taking place. In the cases of the producers of good pig iron, however, matters are on a decidedly better basis, there being a strong inquiry both for present and future deliveries. Many of the best pig firms have already sold their output for a couple or three months ahead, and such as prefer "to keep the whip hand" of the market are able to realize a couple of shillings or so per ton higher prices, as compared with the figures current a month ago. The hardwares, taken as an entity, are hardly so well employed, nor is the Sheffield cast steel industry any better engaged than when I last referred to it in detail. The metal markets are quietly firm.

ANOTHER TERRIBLE RAILWAY ACCIDENT

took place in this country on Friday night, there being a tremendous snow storm at the time. The up Scotch express train, known all along the East Coast as the "Flying Scotchman"—the fastest running train in the world—ran into a coal train which was being shunted at a little place called Abbot's Ripton, and which it smashed up, beside being itself wrecked. The wreckage was thrown over upon the down line of rails, along which the down Northern express was coming at fully 60 miles per hour. This express also dashed into the heap of ruins, partially cutting through and being partially piled upon the first train and the smashed up coal wagons. The result was, as you may very well imagine, most disastrous, both the express locomotives being completely broken to pieces, seven or eight carriages reduced to match wood, and the line torn up. Worse still, 13 persons were killed and about 40 more or less seriously injured. The Russian ambassador was in the train, but escaped unhurt, although his secretary had his leg broken. Lord Colville, of Cubross, a director of the Great Northern Company, on which line this accident happened, was in the train but escaped unhurt. Three other persons in the same compartment were killed. This dreadful affair, with others which have preceded it, appears to point out, once more, that the only safeguard against these disasters is to have double sets of rails, for the separate working of the goods and passenger traffic. Parliament may be asked to take the matter in hand, and if it decides that the lines shall be doubled the rail trade, even yet, may have a bright future opened out to it.

THE PIECE WORK QUESTION

is still exciting a great deal of attention in the engineering trade, and there really appears to be some probability of an open rupture resulting. The central point is still at Erith, Kent, where Messrs. Easton's and Anderson's works are situated. The firm continue to engage men, but these are met at the railway stations by "pickets" and have so far been amenable to persuasion and bribery and have gone away again at once. The whole body of the members of the Amalgamated Association (men) is being polled in order to ascertain whether or not the majority is in favor of a levy of sixpence per week per member for the men locked out, and the greater number are being found to favor that course. These returns also prove that trade is very bad at 22 places, bad at 129, moderate at 137, and good in four instances only.

CO-OPERATIVE IRON WORKING.

The Newcastle *Journal* says: The half-yearly report of the directors of the North of England Industrial Iron and Coal Company (Limited) was issued to the shareholders on Thursday. Several co-operative societies are large shareholders in the undertaking, which has blast furnaces and rotary puddling furnaces at Carlton, near Stockton; coal mines at East Howle, in the county of Durham, and iron stone mines at Allesbury, in Cleveland. The directors regret being unable to report any improvement in the general condition of the iron and coal trades during the past six months. The impossibility of realizing remunerative prices for malleable iron in the present state of trade has led them to a temporary suspension of operations at the forge in Carlton Iron Works; and although the experience recently gained has not been free from some additional loss, it has strengthened their confidence in the ultimate success of the system (Crampton's) of mechanical puddling which they have adopted. The blast furnaces have worked regularly, and a small profit has accured. At the collieries the Brockwell seam of excellent quality of coal is reached by a new shaft, and the thickness—above four feet—is greater than anticipated, exclusive of the top splint coal. At the Hutton Pit the output exceeds 400 tons daily, with increasing demand at fairly remunerative prices, and arrangements are in progress for providing the increased number of houses needed for the complete development of the new undertakings of the company. Some capital had been sacrificed by abandoning the South Belmont Ironstone Mines in Cleveland, but more serious and continuous loss is thereby avoided, and they consider the sacrifice in a great measure made up by value of the lease of Allesbury Ironstone Mines, which continue to give a profitable return upon the capital invested. In conclusion, the directors regret the present precarious state of trade will not allow them to recommend an interim dividend on preference shares, but they believe the extreme limit of the depression has now been reached, and they look forward hopefully to a revival of trade in the spring, which will essentially improve the position of the company, and justify a resumption of work under favorable conditions at Carlton Forge, in conjunction with the new plate mills.

SCOTCH PIG IRON.

The Glasgow warrant market opened quietly last week, and continued easy up to about Thursday afternoon, when some little improvement took place, and prices closed on Friday evening at 64/3 as compared with 63/ on Monday morning. Some of the brands of makers' irons were also a trifle weaker, but as a rule the quotations in this respect were not capable of being greatly shaded. During the week ending January 15th, the shipping business done amounted to 7105 tons, as against the total of 8314 tons in the corresponding week of 1875. Ballast pig iron is still 47/6 per ton, and freights are unaltered. Writing from Glasgow on Jan. 21st, Messrs. James Watson & Co. said: The market has been easier this week, with business done in warrants from 65/1½ to 63/, cash, recovering to 64/, and closing buyers thereat.

	No. 1.	No. 3.
G. M. B., at Glasgow	65/6	64/
Gartsherrie, "	76/6	67/6
Coltness, "	80/6	67/6
Summerlee, "	72/6	67/
Langloan, "	76/6	66/6
Carnbroe, "	68/6	65/6
Calder, at Port Dundas	78/	65/6
Glengarnock, at Ardrossan	71/	66/
Eglinton, "	66/	65/
Dalmellington, "	66/	65/
Shotts, at Leith	76/6	68/6
Kinneil at Boness	67/6	64/6

Messrs. John E. Swan & Brother's (limited), prices current, same place and date:

Glasgow Brands.	Furnaces B'wing, 11th	Furnaces Out 29.	Furnaces Built, 155.	Prices. No. 1.	No. 3.	No. 4
Gartsherrie	13	3	16	76/	67/	68/
Coltness	12	0	12	80/	67/	..
Summerlee	5	1	8	72	65/	66/
Langloan	6	0	8	76/	67/	66/
Govan	5	0	5	65/	63/6	66/
Calder	4	0	7	77/	65/	66/
Shotts Bess'mer	2	0	2	80/	..	..
Shotts Ordinary	3	1	4	76/	68/	..
Carnbroe	5	1	6	68/	65/	66/
Wishaw	2	0	3	..	..	..
Monkland	5	1	6	65/	63/6	65/
Chapelhall	3	0	3	70/	..	..
Clyde	5	0	6	65/6	64/	..
Quarter-Clyde	4	0	5	65/	63/6	..

* f. o. b. Glasgow, 1/ per ton, extra.

Glasgow Warrants, 3-5 No. 1; 2-5 No. 3, g. m. b., 64/.

WEST COAST BRANDS—*f. o. b. Ardrossan.*

Glengarnock	Brand'd Eglint'n	7	2	9	70/6	65/6	65/6
Ardeer		4	1	5			
Eglinton		6	2	8			
Lugar		4	0	4	65/	64/	65/
Muirkirk		3	0	3			
Portland		3	3	6			
Dalmellington		6	2	8	65/	64/	64/

EAST COAST BRANDS—*f. o. b. in the Forth.*

Kinnell	3	1	4	67/6	64/	..
Almond	2	1	3	67/6	64/	62/
Carron { Select'd / Ordn'y }	4	2	6	70/ / 67/	..	..
Lochgelly	0	4	4	..	..	..
Lumphinnans	0	2	2	..	..	..
Bridgeness	0	2	2	..	..	..

Furnaces in blast in Scotland.... { Jan. 21, 1876—116 / Jan. 21, 1875—118 } (Producing about 173 tons per furnace, per week)

TRADES OF SHEFFIELD.

Again I have to report a tame, dull and unprofitable amount of business done during the week which has elapsed since my last report was penned. Nothing has transpired in the interval, to my knowledge, which is calculated to afford any hope of the early revival of trade. On the contrary, every indication points to the advent of still more troublous times. Wages, it is on all sides becoming evident, must be lowered considerably, and the price of fuel must be brought down greatly before our iron and steel makers can hope again to stand on a sound footing. The facts which have already transpired in connection with the engineers' dispute at Erith show that the trades unions are not disposed to submit to any infringement of what they allege to be the "rights" of their members, and that they will fight the various disputed matters out to the bitter end. This, indeed, is the temper and disposition of the workmen generally. They declare that even now they are not being paid wages which are in proper proportion to the prices obtained by their employers. The masters argue exactly the opposite, so that if the latter are correct—which there is little reason to doubt—there is nothing but an ultimate appeal to the relative strength of either side. To test the matter by a lock-out would appear to be a severe step, but there can be no doubt whatever that if a lock out is to be the ultimate course of proceeding, it would be much more wise as well as merciful to make it a thoroughly general one from its very onset. I am not now alluding to the engineering branches in particular, but to the iron trade as a whole in this part of the kingdom. Supposing, however, the engineers' dispute to result in the threatened lock-out, it would not be likely to have any serious effects here unless, indeed, the non union men were also excluded from the shops. There is not a great deal of piece work done in Sheffield, except at the tool shops, where specialities are produced over and over again. At all the large establishments there are engineering departments, but the bulk of the work, such as planing, boring and slotting armor plates, is let off by contract at so much per ton, and the contractors sublet to the men. While on this subject, I may state that on Saturday last one of the leading steel firms discharged over 100 men, and has laid off 20 melting furnaces. The remainder of the men have submitted to reduced wages, and are working about three days per week. Another great steel concern is making numerous revisions and alterations of the working staff, necessitating the discharge of numbers of men and the acceptance of lower pay by those who remain. Up to the time of writing I have not heard of any movement in the direction of reducing the iron workers' or colliers' wages—both of which are propositions likely to be put into force at any time.

There have been a number of transactions during the week in pig iron—mostly foundry numbers—at prices which, on the average, are those of the last fortnight. A good foundry No. 1 pig, produced by a leading Derbyshire concern, is now worth 68/ to 69/, and No. 3 65/ to 66/. Yorkshire Thornaby pig No. 3 is selling at something like 62/6, and others of similar quality at a like quotation. In the demand for hematite pig irons there is little current variation, but, if anything, there is a tendency toward less firmness in respect of the Bessemer qualities. Maryport hematite No. 3 is 72/6; No. 4, 72/6; No. 5, mottled and white, 72/6. Bessemer No. 1 is 80/; No. 2, 77/6; and No. 3, 75/, less the usual 2½ per cent. for cash. Millom Bessemer No. 1, 80/; No. 2, 77/6; and No. 3, 75/. Ordinary No. 3, 72/6; No. 4, 71/6; No. 5, 71/6; mottled, 80/; and white, 80/, on four months' terms, or with same allowance for cash as that just mentioned. The Bessemer converters hereabouts are only indifferently engaged, and the rail mills—with, I believe, two exceptions—lack work. One local concern is running through an order from a home line very rapidly.

Tires are selling pretty well, taking into consideration the dullness of the other railway branches, mainly on account of the railway carriage and wagon builders. English made tires are preferred to Belgian ones for the best classes of work, although I believe I am correct in stating that Belgian tires are now being delivered to a house within a few miles from Sheffield. There is a steady demand for railway box wagons, trucks and coal wagons. The last are chiefly on account of the newly opened collieries in the district, or to the order of the wagon companies, which have large transactions with the smaller colliery, &c., concerns. The cast steel trade, as will have been inferred from part of the preceding, continues very dull, and has, apparently, no prospect of improvement before it.

A conference took place in Sheffield last week, on the subject of the substitution of wedging for blasting in the collieries of the district, resulting in the question of extra payment being referred to arbitration.

THE SWAITHE EXPLOSION.

The inquest as to the cause of the Swaithe Main explosion, which caused the death of 143 persons on December 6th, was concluded at Barnsley on Friday last. Mr. Gerard, the assistant inspector of mines for the district, gave it as his firm opinion that no shot had been fired on the day of the explosion, which might have resulted from a bad lamp. Mr. Wardell, government inspector, read a long report relating to the matter generally, in which he strongly condemned the use of powder in the mine. Mr. Evans, government inspector for Derbyshire, agreed with the two other inspectors that there had been two explosions, and that the Stephenson was not so safe as the Davy lamp. Mr. Wilson, manager of the Oaks Colliery, inclined to the opinion that the Stephenson was the better lamp. The jury brought in a verdict stating that there was insufficient evidence to show how the explosion or explosions occured; that the Swaithe Main is a firey mine; that the general and special rules have not been rigidly enforced, and that gun powder has been recklessly used. They also expressed the opinion that in all mines where safety lamps are used, powder should not be allowed except in stone drifts, and then only when the men are drawn out. In this connection I may state that Mr. Joseph Mitchell, senior proprietor of the colliery, died, aged 69, on Tuesday night.

In the cutlery departments there is very little business doing, the call being chiefly for best table knives and very common razors, scissors and pocket knives. Rogers are only poorly engaged. George Wostenholms' have not been so badly supplied with orders for at least ten years.

THE GERMAN IRON TRADE.

The *Deutsche Industrie Zeitung* gives the following statement: "On account of the reduction in quantity and fall in price, the total value in Prussian iron products in 1874 is £6,800,000 less than that of 1873, and the present year will show a still lower figure. In 1873 there were 1097 works in activity against 1074 in 1874, the blast furnaces and foundries being respectively 163 and 150. The production of pig, wrought iron and steel was 3,083,000 tons in 1874, against 3,227,000 tons in 1873. Spiegeleisen, which in 1873 had fallen from nearly £14 a ton to below £8, did not fetch £5. 4/ at the end of 1874, at which period raw pig was a glut in the market at £4. Of the 349 blast furnaces which exist in Prussia, only 245, or 70·2 per cent. were in blast in 1874, against 276 in 1873; while the mean production of each furnace was 5225 tons in 1874 and 5702 tons in 1873. The number of hands employed in the foundries, ironworks and steel works in 1874 was 110,986, against 112,238 in 1873."

STAFFORDSHIRE AND BIRMINGHAM.

The last week's 'change gatherings at Birmingham and Wolverhampton were not productive of any material alterations, either in respect of prices or the demand. The best brands of finished iron sold in small lots pretty freely. They are in use for specific purposes, and, like the Yorkshire, Low Moor and Bowling qualities, will always sell to a given extent. Good bars are, therefore, £9. 10/; best, £10; Earl Dudley's, £10. 12 6; good rivet iron, £11. 10/; best best rivet iron, £13; angle bars, £10 to £12; Ts, £10. 10/ to £12. 10/; good hoops, £10 for sizes down to 19 W G and 3¾ inches, 20 W G being £11. 10/; reliable sheets at £11. 10/, £12. 10/ and £13, according to the brand, and charcoal singles, £24. Plates range from £12 to £14. Earl Dudley's rounds are £10. 12/6 for common, £12 single best, £13. 10/ double best and £15 for treble best. Rivet irons of his lordships round oak brand are £13, £14. 10/ and £16. 10/ respectively. L. W. R. O. angle irons and coronet brand up to 8 inches are £11. 12/6, £12. 10/, £14 and £16, for respective qualities. T iron is 10/ more in each instance, and strips on the same terms. Treble best strips, seven-eighths, £17. 10/, and three-quarters, £18. 10/ per ton. In the hardware branches there is hardly so much business being done.

SOUTH WALES.

A few orders are still coming into this district, and those on hand in the contiguous works in Monmouthshire are for Venice, Vigo, Huelva, Santos and Oporto. At the Landore Siemens steel works a quantity of large steel plates are being made for the new Pembroke dockyard. At Blaenavon Works there is still a dispute with the puddlers. The coal trade is growing brisker. Last week 126 vessels cleared from Cardiff with 76,294 tons of coal and 1224 of iron—all the latter being for Halifax, Nova Scotia. From Swansea 46 vessels cleared in the same period with 8358 tons of coal, 5500 of patent fuel and 140 of iron. From Newport (Monmouthshire) 29 vessels sailed with 9930 tons of coal and 2566 of iron. The tin plate trade is a little steadier.

THE METAL MARKETS.

On Monday the markets opened steadily—copper being a little firmer. 200 tons Lota g. o. b. sold £81. 15/; 150 tons named brands, £82 to £82. 15/; and 25 tons Burra, £89. Tin was steady: Shorts at £79. 10/. Lead was rather firmer, but quicksilver lower, good business being done at £10. On Tuesday little actual business was done at the preceding day's nominal quotations. On Wednesday, 100 tons Chili bars at £81. 12/6; Wallaroo being quoted £89. 10/, and Burra, £89. Tin a little quieter, if anything. The same on Wednesday. On Thursday and Friday, Chili bars, £81. 15/, and special brands, £82. 15/; 25 tons Burra at £89. Tin was steady; Straits at £79 to £79. 10/.

Messrs. Von Dadelszen & North say: "*Copper* rather firmer; a moderate business in Chili Bars, at £81. 10/ to £81. 15/ for g. o. b., and £82 to £83 for named to best brands. In Australian, Wallaroo has been sold at £89. 10, and Burra at £89. English unchanged. *Tin* very quiet. Small business in Straits, on the spot, at £79 to £79. 10/, and for forward delivery at same prices. Australian, spot, realized £78. 10/; about 100 tons for distant arrival at £78. Banca nominally £49; Billiton, £48; English again rather easier; ingots, £82; bars, £83. Tin plates without change. *Lead*—Market quiet, and prices rather easier. English pig, £22. 12/6 to £22. 16/; and Spanish, £22 to £22. 5/. *Spelter*.—About 150 tons in outports were reported at £25. 12/6 for ordinary, up to £26. 2/6 for special brands; but there are sellers now at £25. 10/. *Quicksilver* reduced to £10, at which a fair business has been done.

I extract the following from the monthly iron and metal circular of Messrs. Sanders Brothers, of London, Liverpool, &c.:

Copper.—Our present quotations are:

	£ s.	£ s.	£ s.	£ s. d.	Compared with same date 1874.
Ores and regulus..	0 16 to	0 17	0 16 to	0 16 6	per unit.
Chili Bars..81	10 to 82	10	83 0 to 86	0 0	per ton.
English Tough...£7	0		88 0 to 91	0 0	"
English selected....83	0		90 0 to 93	0 0	"
English Manufactured.....92	0 to 95	0	95 0 to 97	0 0	"

	Month ended 31st December. 1873.	1874.	1875.
Exports to—	Cwts.	Cwts.	Cwts.
U. S., unmanufactured....	120	2	....
Other countries, unmanufactured	16,101	13,300	13,752
U. S., manufactured	230	200	100
Other countries, manufactured	21,571	14,187	23,322

	Twelve months ended 31st December. 1873.	1874.	1875.
Exports to—	Cwts.	Cwts.	Cwts.
U. S., unmanufactured....	45,108	926	20
Other countries, unmanufactured	204,079	214,847	221,774
U. S., manufactured	1,848	960	271
Other countries, manufactured	213,640	210,167	235,170

Foreign Copper has been quiet and very steady since our last issue. Our to-day's prices are about the same as those of a month ago. The fluctuation has been unimportant, a slow drop of 10/ which was speedily regained, and there is little light on which to base any prognostications for the future. Stocks are small, and with good trade and activity we might easily see a noteworthy rise in values, but at present things look rather as though we should drag along, at about present prices, for some time to come. Charters for second half of December were 3300 tons, and for first half of January 1500 tons, making a large monthly average. The total figures for 1st January were 34,942 tons, against 35,351 tons, being a decrease again of about 400 tons. There is still no disposition to buy, except for actual requirements.

English Copper.—Our last month's remarks apply equally again, tough and selected ingot copper being more pressed for sale by smelters, on account of scarcity of manufactured orders; and relatively these kinds are cheap in comparison with Chili and Australian sorts. The consumers assert that competition for orders is so very keen that the profit is reduced to a minimum, and order books generally are light. They therefore only buy from hand-to-mouth.

Manufactured Copper has been exceptionally quiet, very few fresh orders coming in. Sheets for India have been sold as low as £92, but even at this figure demand is very small, and unless it improves there seems little prospect of a brisk trade again until the opening of the Russian shipping season.

Lead.—Our present quotations are:

	£ s.	£ s.	Compared with same date 1874.
W. B.	23 15	24 10	per ton.
L B	23 0	23 15	"
Lead Co.	23 0	23 15	"
Ordinary Brands	22 15	23 10	"

	Month ended 31st Dec. 1873.	1874.	1875.
Exports to United States.	282	95	92 tons.
" other countries.	2,189	1,454	2,012 "

	Twelve months ended 31st Dec. 1873.	1874.	1875.
Exports to United States.	2,917	2,709	285 tons.
" other countries.	29,093	33,584	35,220 "

Lead has been in increased demand again, and prices have advanced all round about 10/ a ton. As we close the market is steady and firm, and current values are fairly maintained.

Regulus of Antimony.—Present price, £59, as compared with £54 same time last year. Business for the States is still quiet, but for the Continent more active. There seems to be some little hitch about the association, but the Continental demand seems sufficient to maintain prices steadily.

Tin.—Our quotations to-day are:

	£ s.	Compared with same date 1874. £
English L. & F. Ingots	82 0	99
" Bars in barrels	83 0	100
" Refined	81 0	101
Banca	87 0	99
Straits	79 0	92
Australian	78 10	91

	Month ended Dec. 31. 1873. Cwts.	1874. Cwts.	1875. Cwts.
Exports to United States	2,433	4,557	2,294
" other countries	8,408	4,321	4,844

	12 months ended Dec. 31. 1873. Cwts.	1874. Cwts.	1875. Cwts.
Exports to United States	29,958	50,591	16,570
" other countries	85,192	101,022	87,870

The imports of tin into England have been:

	1873. cwts.	1874. cwts.	1875. cwts.
Month ended Dec. 31.	23,292	17,916	15,919
12 Months ended Dec. 31.	155,424	184,377	335,481

Tin during the past month has slowly but persistently drooped in value, and the fall all round is about £2 to £3, with very quiet demand and continually increasing stocks. The deliveries for December were 1300 tons, still light in comparison with some months of last year, but rather heavier than those of November. The difficulties in Penang were settled very shortly after our last issue, and the figures, which show a noticeable increase, bear out the prognostications contained in one of our previous issues, that the disturbance in Penang, instead of enhancing the price, as most people supposed, would probably at first have the effect of causing increased shipments from thence, with a corresponding fall on this side; and this seems to be exactly borne out by the facts. Stocks will be observed to have increased about 700 tons on the month. December, January and February are generally heavy shipping months from Australia, and we may therefore probably find stocks continue to increase, rather than the reverse, for some little time to come, unless any unforseen circumstances should produce a different result.

English tin has been in small demand, and slow of sale, gradually falling in price, following Straits, and to-day smelters quote £82, refuse to sell at £81, but in some instances we hear small lots have been done at £81. 10/. It must always be borne in mind that the price of tin is now so low in comparison with that ruling during recent years, that at any time if speculators took it in hand, a rapid rise might be effected, even though it might not be permanent. The market is therefore very sensitive and difficult to express decided views about.

The following statement shows the present position of tin:

	Nov. 1, 1875. Tons.	Dec. 1, 1875. Tons.	Jan. 1, 1876. Tons.	Jan. 1, 1875. Tons.	Jan. 1, 1874. Tons.
Foreign tin in London	5,593	5,950	6,018	2,895	2,038
Banca and Billiton in Holland.	1,481	1,180	1,737	1,476	1,415
Stocks	7,074	7,130	7,755	4,371	3,453
Banca in hands of the Dutch Trading Co. unsold.	2,275	2,640	2,061	3,738	3,590
Foreign tin afloat for Europe	3,717	3,235	3,960	3,895	1,255
Total	13,066	13,005	13,776	12,004	8,298

Spelter.—Our present quotation for ordinary Silesian is £25, compared with £23. 15/ same date last year. English, £26, f. o. b., nominally unchanged in value. Stocks are small, and the price on the Continent is higher than that obtainable here. We consider the market steady with, however, rather a weaker tendency than otherwise.

Tin Plates.

		Compared with same date, 1874.
I. C Coke, ord. brands.	21/6 to 22/	26/6 to 28/
I. C. Coke, best "	23/ " 25/	29/6 " 34/
I. C. Char., ord. "	25/ " 26/6	33/6 " 35/
I. C. " best "	27/ and up.	37/ " 42/

	Month ended 31st Dec. 1873.	1874.	1875.
Exports to United States.	4,665	7,068	6,935 tons
" other countries.	2,829	2,498	3,783 "

	Twelve months ended 31st Dec. 1873.	1874.	1875.
Exports to United States.	85,527	91,407	95,995 tons.
" other countries.	35,111	31,553	42,568 "

The shipments of tin plates as per Board of Trade returns, for this and two previous years, are as follows:

1873	120,638 tons,	equal to about	2,412,760 boxes
1874	122,960 "	" "	2,459,200 "
1875	138,563 "	" "	2,771,260 "

The stock of plates in Liverpool is estimated now at 240,000 boxes.

Old Rails still continues very dull, with very little business passing, and the same difficulty is still experienced in putting orders through with the States. We quote for these nominally £4. 15/ c. f. & i. New York.

The improvement in demand referred to in our last, seemed to disappear at the commencement of the Christmas holidays, and ever since there has been an almost entire cessation of orders from the States. So far this has not had the effect of weakening prices much, as makers who booked to a fair extent in December are kept going on old orders, but as these must soon be worked off, we think some concession will have to be made before long to secure fresh ones, unless, of course, buyers come into the market of their own accord. The Birmingham Quarterly Meeting was held on Thursday, the 15th inst., but everything passed on very quietly, and no business of any importance was transacted. As a rule we find charcoal tin rather firmer than cokes, and for the grade of E.C.C. L.P.L., &c., the price quoted is 26/. For such brands as "Allaway" and "P.N." 25/ is asked, and lower grades still can be had at 24/ to 24/6. Charcoal ternes are held now for 23/, makers having sold largely at 6d. below this, but we do not think there are any buyers at the higher price. For coke tin, brands of the oil grade such as B.V., L.F., &c., the general quotation now is about 21/6, but even this figure does not seem to attract business.

The Properties of Malleable Cast Iron.

The increased flexibility of malleable iron, according to Mr. R. Mallet, is to be attributed to the fact that small crystalline scales of graphite are uniformly disseminated through the mass of the iron. Ideal it is otherwise known that the most rigid materials become flexible when fibrous or scaly crystals of different natures are distributed through them; these latter may themselves form in flexible bodies when united to larger masses. The flexible Indian sand stone, for instance, consists of a mass of quartz crystals through which fibres of asbestos are uniformly disseminated; other kinds of flexible sand stones contain mica crystals in the quartz mass, as, for instance, the itacolumite, which, in Brazil, is regularly associated with the diamond. The flexibility of the respective bodies must in all these cases be ascribed to the property of the smooth crystals to change their relative position to each other, and, with regard to the mica scales in the sand stone, they behave like the graphite scales in the iron.

According to Pelouze and Fremy the specific gravity of malleable iron approaches very nearly that of cast iron. Brull, as the result of three determinations, found the numbers 7·10, 7·25 and 7·35. The specific gravity of wrought iron being from 7·6 to 7·8, we have another proof that malleable cast iron is not identical with wrought iron. The fracture of malleable cast iron is very different from that of any kind of wrought iron; it is darker and less brilliant, and lacks that fibrous aspect so characteristic of tough wrought iron. It is similar to dark and ordinary pottery, but different from it in color and lustre. In forging, the aspect of the fracture becomes greatly altered, on account of the flexibility of the material, which sometimes requires considerable hammering before it breaks. The fracture of very carefully manufactured malleable iron appears on the average more like that of a very fine grained, white cast iron than that of wrought iron In large pieces the fracture is uniform throughout. In filing, turning and planing it works quite similar to wrought iron, but the surface often appears somewhat whiter. Large pieces can seldom be well turned to a great depth. According to some statements, malleable iron is capable of taking a better polish than cast iron, and it takes as good a one as cast steel. It also holds a better lustre than many sorts of dark and impure wrought iron, but the polish is inferior to that of good steel, as in razors of first quality, even the surface appears a little whiter. Good hard cast iron may probably be polished as well. With regard to the hardness, reliable data are not procurable. Malleable cast iron is generally very soft—softer than wrought iron of any kind. It takes the impression of the hammer with a very slight blow, and wears off rapidly in contact with rough surfaces.

It is exceedingly porous, as may be expected from its small density. According to Brull, oil, when left in a cup of malleable iron, penetrates through it in a very short time; the correctness of this assertion, however, remains doubtful. Cast iron bells are far more elastic than bells of malleable iron, producing also a higher and clearer sound.

Morin and Tresca have found that the elasticity of malleable cast iron is considerably less than that of the most inferior wrought iron. The absolute power of resistance is indicated by the latter as being 35 kilogrammes per square meter. Thin pieces, of a diameter not over one-quarter or three-eighths of an inch, may be bent while cold without cracking; but they can rarely be restored to their original state without being partly or altogether fractured. However, the end of a rod may be forged till red hot, without a break or crack being produced; thin plates may safely be hammered into hollows, provided they are not too deep. Malleable iron will bear rolling to a small degree. All these manipulations bring about a closer grain, and a fracture similar to that of fine grained steel like iron. No instance is known where malleable iron has been drawn into wire; but this is possible, since it will bear a slight elongation, assuming thereby a finer grain. It may be pretty well forged at a low, red heat, somewhat above a cherry red heat, but in endeavoring to beat it out, it tears and breaks to pieces. According to Mallet, this temperature, and that beneath a bright yellow heat, are those at which it may be best forged; but it is more than probable that various kinds act differently under the same circumstances. This peculiarity certainly deserves further attention, on account of the fact that various articles which have not, as yet, been produced from malleable iron, might advantageously be made from it in cases where the form of the cast piece might have to be altered afterward. When hammered at yellow heat, malleable iron falls to pieces, and large, not uniformly cemented pieces, appear in the interior.

It is clear that malleable iron cannot be welded properly; indeed, this is the case even if two pieces can be made to stick together, and the surface of contact be kept free from rust; it is self-evident that it cannot be welded with wrought iron or steel, still it may be soldered with them by means of hard solder. With respect to the fusing point of this metal, it is a high one; it lays above that of gray or halved cast iron, but probably not above that of many sorts of white or hard cast iron, and certainly considerably below that of cast steel. In the fire malleable cast iron is said to become more slowly oxidized than ordinary cast iron. In France the silver refiners use a large number of crucibles that are manufactured from that material, but no accounts exist of how much iron they leave to the silver. According to Brull, malleable iron can be tempered with the ordinary carboniferous cementing powders, as well as with prussiate of potassa. If watered when bright red hot, it may be tempered more or less; still, the temper is always imperfect, not uniform, and quite different from that of good steel, but perhaps more perfect than that which wrought iron assumes when suddenly cooled. Still, correct statements are yet wanting with regard to this point.

The Swiss Exhibits at the Centennial.

The Swiss exhibit will be small, but compact, complete, well classified, and admirably catalogued. It will all find place in the Main Building, except the photographs and lithographs, and possibly a few oil paintings, which belong in the Art Hall. No machinery will be sent, and nothing for either the Agricultural or Horticultural Department. All the preparations, even to the making of show cases and the printing of catalogues, have been made by the home commission, whose headquarters are at Winterthur, in the Canton of Zurich, so that when the goods arrive here—in February or March—there will be nothing to do but to put them in position. The space they will occupy has an area of 6646 square feet, in a narrow strip running half way across the building, from the side toward the Art Gallery to the central nave. For next door neighbors Switzerland will have on one hand Belgium, covering more than twice as much space, and on the other the still broader area of France, while across the nave will be the vast territory of the United States. The Swiss commission is composed of the following members: Col. H. Rieter, commissioner-general, Winterthur; Edward Guyer, secretary-general, Zurich; John Icely, engineer, Basle; and Rud. Koradi, consul, resident commissioner, Philadelphia. Col. Rieter will not be able to attend the Exhibition, and the affairs of the Commission here will be managed by Mr. Koradi with the assistance of Mr. Guyer, who is expected early in the Spring. A small chalet will be put up in the main building for the offices of the Commission.

The number of Swiss exhibitors, classified according to the articles they contribute, was given in late advices from Winterthur as follows: Chemical products, 20; cotton and woolen fabrics, 16; lace, 24; silk fabrics, 19; straw goods, 16; extracts and chemical preparations, including condensed milk, an important article of export, 8; watches, 49; tools for watchmaking, 10; scientific instruments, 5; carved wood articles, 16; musical instruments, 7; typography, 19; photography, 9; preparations for food, 8; leather, 2; liqueurs and brandy, 14; educational, 14; building and engineering, 58; miscellaneous, 24; making in all 398 exhibitors. There were expected to be additions to the last that would bring the number up to about 425. The educational exhibit will be particularly interesting. The labors of Pestalozzi have left a permanent impress on the school system of Switzerland, and methods of instruction which are only beginning to be introduced in this country under the name of object teaching have long been practiced there. To teach the child to think for himself, instead of merely repeating by rote formulas from books, and to acquaint him with the nature and uses of the objects around him, are the essential things in the Pestalozzi system. Americans may expect to see in the contributions of the several Cantons to the educational exhibit the models, drawings, etc., which have been found most useful as aids to this system, as well as the ordinary text books and apparatus. Interesting statistics showing the cost of the schools in the different Cantons will also be included.

Among manufactured articles watches will, of course, occupy the first rank, but what will most arrest the eye and excite admiration will be the show of laces, and especially of lace curtains, from the Cantons of St. Gallen and Appenzell. The manufacturers of silk ribbons—an industry whose chief seat is in Basle—declined to send their goods. Since the successful establishment of ribbon manufacturing in this country they have been deprived of their best market, and naturally did not care to go to any expense to show to their former customers the articles which the latter now refuse to buy. Some merchants have, however, purchased from the makers a full line of samples, so that this important branch of Swiss industry should not be unrepresented. In the same way the cotton prints of Glarus will be exhibited. Some of the Swiss papers express doubts as to the commercial value of the exhibition to Switzerland, and speak as if many of the principal industrial establishments are led to contribute to it by patriotic feeling rather than by motives of self-interest. Such manufacturers as have a large trade with the United States, like the watchmakers of Geneva, are, of course, not of this class. It is gratifying to learn that commercial ideas have not alone governed the formation of the Swiss exhibit, and that all the leading industries of the little mountain Republic will be adequately represented.

Phosphide of Copper.—What has recently been introduced with some *eclat* as an alloy of copper and bronze proves not to be an alloy, but a true chemical combination of copper with phosphorus, or a phosphide of copper in definite proportions. The union of the two may be through the cold or the hot process, the cold sufficing for certain applications, being preferable indeed to combinations produced by heat. By the hot process the introduction of simple bodies other than the metals or metalloids is prevented. The copper used in the process must be commercially pure. Of the three kinds of phosphorus the operator may take his choice; the ordinary, the amorphous, and the earthly bi-phosphates. The amorphous is the most expensive, and is also the best. According to Delatot, the percentage of phosphorus varies from 2 to 4, between which there may be an infinity of degrees, although for industrial purposes five varieties meet all the requirements. These are formed with 2 per cent. of phosphorus, 2½ per cent., 3, 3½ and 4 per cent. Above 4 phosphor bronze is useless, but between 3 and 4 per cent. the material is claimed to be superior to any other metal or alloy. The price of phosphor bronze, unworked, should not exceed that of copper, plus 10 per cent.

BUSINESS ITEMS.

MASSACHUSETTS.

The whole stock of the Bay State Valve and Faucet Company, Chicopee Falls, has been sold to a Boston party. The tools and machinery have been purchased by the Belknap Manufacturing Co., of Bridgeport, Conn. They will be taken to Bridgeport at once.

The *Commercial Bulletin* has the following gossip: West Meriden, Conn., is astir over a proposition to locate the New England Glass Company in that town, and her local print gloats over the raising of $100,000 to further the object. This company was organized in Boston in 1818, and has a real estate investment at Cambridge, of over $100,000, the total available assets being $529,614, with half a million capital. The company has had no intention of moving or of selling out, but if a new concern is organizing to gobble it up, few rational investors would recommend abandoning the present plant which has all the advantages of over half a century's experience. Two years ago, when this company passed its dividend, there was a gossip that it purposed to sell out. Each stockholder questioned was confident such a procedure would net them the return, and a handsome profit on their stock, but the company continued making glass and the next year paid as usual its dividends. The exact momentum of this West Meriden movement is surmised from the connection with it of two former employes of the New England Glass Company. Those who from time to time have read our reports of the inertia in this glass industry in Pittsburgh, Wheeling, Brooklyn and New Jersey will rejoice in any fact which can indicate its certain success in "the land of steady habits," and whether the El Dorado of the glass trade is to be West Meriden.

NEW YORK.

Several improvements have been made at the steel works at Troy, for two months past, during which no steel manufacturing has been in progress. A new engine of 600 horse-power, for working the rolls, has been put in place. Three immense cupolas have displaced those formerly in use. A crane capable of lifting eight tons, and a force pump have been added. The force pump works at a water pressure of 800 pounds to the square inch. Heretofore the cupolas have only been operated 12 hours at a time without dumping, whereas it is expected that the present cupola may be run for 48 consecutive hours. This is due to the fact that the new cupolas are twice as large as the old ones.

NEW JERSEY.

The *Trade Journal*, of the 5th, says that the iron Pantheon constructed at the car foundry, Trenton, for Port-au-Prince, was shipped to its destination last week. It filled 19 cars, and included 385,997 pounds of cast iron, 20,065 of wrought iron, while the roof frame contained 18,790 pounds of cast and 5515 of wrought iron, making a total of 430,367 pounds.

PENNSYLVANIA.

There is a prospect that the Old Valley Rolling Mill, at Kittanning, which has been idle since March, 1873, will soon resume operations. It is stated that the owners, Colwell, Musgrove & Co., agree to put the mill and other property at a fair annual rental for ten years, to be agreed upon, and to furnish an additional capital of eight or ten thousand dollars, the rental to be paid in repairs, if the citizens of Kittanning, or any other place, will raise sufficient in the way of stock for capital to put the mill in operation and carry on the business. It is not told outside, but it is supposed that a gas well about two miles out of the town has had something to do with this new start. The mill is intended to produce rod and sheet iron nails and spikes, and has an annual capacity of 7000 net tons. The new company will probably go largely into the manufacture of fine sheets, which have been in small supply since the stoppage of the works of Messrs. Rogers & Burchfield.

The sale of the Wheatland blast furnaces and rolling mill has been adjourned to April 11th. These works cost originally nearly if not quite $2,000,000, and the highest bid at the recent attempt to sell was $150,000. No commentary needed.

The Cutlery Works, at Beaver Falls, after a short suspension resumed active operations last week.

The steel works of Messrs. Abel, Pedder & Co., at Beaver Falls, are running largely on cutlery steel for the cutlery works in the same place.

It is currently reported that a stock company is now being organized in Blairsville, the intention being to open up two abandoned wells at Deep Hollow, near that place, so as to secure a supply of gas.

Mount Hickory Furnace, No. 2, at Sharpsville, blew out last week for repairs.

Greenville is getting excited and proposes to bore for gas.

Both of the rolling mills at Sharon—Atlantic and Westerman—together with the nail mill, and the extension of the sheet mill of Westerman, are in operation, which makes it lively.

The Paxton mill, at Harrisburgh, is running double time. The Lochiel, which have been idle for some time, are again in operation, double turn.

The Cambria Iron Co. are about building a huge derrick, or elevator, and a trestle several hundred feet in length at the old Conemaugh furnace. The Johnstown Mechanical Works have the contract.

The Pennsylvania Steel Works are pushing their new furnace along rapidly. An abundant supply of good Bessemer ore would be a mine of wealth in that locality, but this is too much to hope for. Virginia or New Jersey will have to supply this, and if the reports that come from the former locality are correct, the very best Bessemer ore can be laid down in Harrisburgh cheaper than the same grade of Lake Superior ores can be placed in Pittsburgh.

The Cambria Iron Co., at Johnstown, have purchased the old tannery property, near the Pennsylvania R. R. depot at that place, and it is rumored will convert it into a screw manufactory, and utilize their "crop ends" in this way. Possibly tacks may be added to the list of articles, and perhaps hoops. The most serious difficulty in utilizing rail ends has been the difficulty of welding, but this is being done away with as the quality of the Bessemer metal is improved.

PITTSBURGH AND VICINITY.

The Mont Blanc Foundry are running steadily, melting 10 tons per day, and giving employment to 40 men. Product largely pit car wheels.

The stocks of pig iron at the furnaces in Pittsburgh are very light, not to exceed 5000 tons. Stocks at the mills are not one-fourth what they were a year ago, and the amounts in brokers' yards are decreasing.

The Sligo Mill seems particularly unfortunate lately. A few days since it broke a large driving wheel, and had hardly got started again when a piston broke, causing the blowing out of the cylinder head.

So many contradictory statements have been made concerning the Lucy Furnace that we have got at the "true inwardness" of the matter, which is as follows: The furnace had been in blast about six months, when it was discovered that the lining at the top of the furnace was gone. An attempt was made to repair by "damping down," but failed, and the furnace was blown out. On examination it was found that where the bosh should have been 19 ft. 6 in. it was only 15 ft. 2 in., and at first it was supposed that the stock had got behind and pushed it out, but examination proved that a portion of the top had come down intact and telescoped in the bosh and became cemented to the old bosh. The false bosh was removed and the old bosh and hearth found in good preservation. The furnace is being relined only from the bosh up.

On the 31 instant the main shaft at the Clinton Mill of Graff, Bennett & Co. was broken, which will necessitate a stoppage for ten days or two weeks of the whole works, except the sheet mill. This will interfere but little with their business, as their Millvale Works are in full operation.

Chess, Smythe & Co., Anchor Nail and Tack Works, are running their entire mill double turn.

Hussey, Binns & Co., manufacturers of solid cast steel shovels, are now producing steel for their plates, having at their works, corner 27th and Railroad streets, a 12 foot Siemens furnace in operation.

The Clinton Furnace, which blew out on the morning of Dec. 25, 1875, after a blast of over 3 years, is again in blast. The furnace was burdened in at 2 o'clock the afternoon of the 2d, and the first cast was made at 2 p. m. the next day. This is the oldest furnace in the city, and the smallest.

Messrs. Isaac Jones, Son & Co. are still boring away for gas at their steel works near McKeesport. They are down 2200 feet, and have struck several considerable veins, but not sufficient to run their works.

What at one time promised to be a serious strike among the window glass blowers of Pittsburgh has come to a peaceful conclusion, the blowers accepting the 10 per cent. reduction demanded by the manufacturers. The men were out only from Tuesday until Monday last, but need not have been out at all, as the proposed reduction was not to go into effect until the close of last week. In the present state of the glass market the men have certainly shown wisdom.

Our friends across the "mill pond," not being able to beat our Bessemer work in the number of casts and amount of product, are casting up to us that they have made a steel rail 107 ft. 9 in. This beats the largest steel rail rolled in this country, at the Edgar Thomson Steel Works, 47 ft. 9 in.; but we can still boast that we excel them in product.

DELAWARE.

The Edge Moor Iron Company, of Wilmington, have received the contract for furnishing the iron for five miles of the New York city elevated railway, to be built; 3,000,000 pounds are to be used.

WEST VIRGINIA.

The striking tenders at Wheeling have returned to their work at the different nail factories at the reduced rates. They now receive twenty-five cents per machine instead of thirty, and as each tender has eight machines he will earn $2 per day.

OHIO.

The Union Iron Mills at Cleveland are running double. The plate mill of the Cleveland Rolling Mill Co. is again in operation.

The mill of Brown, Bonnell & Co., at Youngstown, is in full operation, as are also their two furnaces.

Both the Hubbard and No. 1 Hazelton furnaces are in blast. No. 2 Hazelton is out.

The Powell Tool Company, Cleveland, started up on the 1st of January, and is now running full, turning out an average of 600 tools per day, 400 of which are axes. They recently filled a large order from California amounting to $7500. They have a large Canadian trade also.

The old Steubenville Iron and Bolt Works are again in operation making hooks.

The Steubenville *Herald* states that a cutlery manufacturing firm, all practical men from the great cutlery works of Wostenholm, England, doing business in a neighboring city, have some thoughts of removing their works to Steubenville, and believes that they would be moved there if proper inducements were held out.

No. 1 Graffton Furnace, 15x16, at Leetonia, is in blast, and No. 2 out, but is being relined, and is now nearly ready to blow in, but whether it will or not depends something on the metal market. No. 1 is making a high grade of Bessemer iron, running as low in phosphorus as 0·098.

The Burton Furnace Co. filed its incorporation papers last week, the corporators being Jonathan P. Burton, John E. McLain, Jerome B. Zerbe, Silas A. Conrad and James Neal. The capital stock is $200,000, and main office at Cleveland. This company will operate the old Massillon Furnace, at Massillon, which has heretofore been run by J. P. Burton.

It is stated that the B. & O. Railroad proposes to build a large rolling mill at Chicago Junction. They already have large shops in course of erection at this place.

The Niles Chain Works are running double turn.

ILLINOIS.

Work has for the last four weeks been suspended at the Union Rolling Mills, Chicago, and necessary repairs have been made throughout. It is stated that the company has purchased the old blast furnace adjoining the works, and will shortly open it, as well as the entire concern, giving employment to about 300 men.

The Mercer furnaces, at Bessemer Station, near St. Louis, are ready to blow in. These furnaces have Whitwell stoves, and instead of the iron jacket, so common in the West, have iron bands to support the stacks.

The Grand Tower Furnace, in the Big Muddy region, produced, in 1875, 10,000 tons of metal. It is still in blast.

The Big Muddy Furnace was not in blast during 1875.

TENNESSEE.

Mr. J. F. James, of Chattanooga, at the request of General Wilder, has undertaken to make the collection of pig irons and ores used in manufacturing of same in the Southern States, for exhibition at the coming Centennial. He requests that furnace owners select from the furnace product two or more pigs of each grade, neat in appearance, and with as smooth a surface as possible, the ores consumed to be in one large piece, and all to be shipped to Gen. Wilder, at Chattanooga, in the pig, unbroken.

Work on the new steel works, at Kingston, has already begun. The works will be erected on the old site of the distillery, and will be under the superintendency of Mr. Leighton, who is an experienced man. Workmen are engaged in putting up the necessary buildings.

MISSOURI.

The Ozark, Scotia, Midland, Moselle, one Iron Mountain, Osage and Pilot Knob charcoal, and Vulcan, Jupiter, one South St. Louis, one Missouri stone coal furnaces are out of blast. The Merimec, Hamilton, Irondale and one Iron Mountain charcoal, and one South St. Louis and one Missouri stone coal in blast, making six charcoal furnaces out and four in, and six stone coal out and two in.

Missouri produced 25,000 tons of zinc ore during 1875.

The receipt of iron ore from all quarters at St. Louis during 1875 was 175,215 tons, an increase over 1874 of 9700 tons.

The Harrison Wire Mill, St. Louis, has been running double turn. Heretofore a supply of billets has been procured from good market scrap, but as this source of supply is too irregular, a set of puddling furnaces has been erected. The mill employs 150 hands.

The following table, giving the make of the furnaces in Missouri for 1875, we compile from the columns of *Mines, Metals and Arts:*

CHARCOAL FURNACES.

	Tons.
Ozark	3,000
Merimec	4,500
Scotia	10,500
Midland	2,500
Hamilton	3,000
Moselle	2,659
Irondale	....
Iron Mountain	6,000
Osage	....
Pilot Knob	16,000
Total	48,159

STONE COAL FURNACES.

Vulcan	....
Jupiter	....
South St. Louis	10,000
Missouri	6,000
Total	16,000

According to the same journal the charcoal furnaces had on hand, Dec. 31, 1875, 31,100 tons of iron and the stone coal furnaces 2100 tons.

Knives and Forks.

Researches into the history of even the commonest articles in daily use, reveals much that is quaint, curious and interesting. Knives and forks were not always the indispensable articles of table furniture we now consider them, and a glance at their history will repay the trouble involved.

Great would be the wonder if, in the present state of refinement, one ever gave a thought to that necessary adjunct of the dinner table, the fork we use, as to what we should do without it; and yet its introduction dates only three centuries back. Neither the Romans nor Grecks have any name for it, and even Pollux does no mention it in his full list of necessaries for the table, the only fork (*kreagra*) noticed being one in resemblance to a hand, to fish meat out of the pot; this is also noted by Anaxippus. Beckmann, in his "History of Inventions," says: "Equally inapplicable to our forks are the words *furca, fuscina, fuscinula* and *gabalus*, which are given in dictionaries. The first two were, undoubtedly, instruments which approached nearly to our furnace and hay forks."

Formerly food was cut into small pieces before being placed on the table, for the convenience of the diners, who, reclining on couches, could not use both hands with ease. Persons of rank kept a carver, who used the only knife placed on the table; this knife had an ivory handle, and in the houses of the rich was ornamented with silver. Posidonious relates: "The Gauls used to take roast meat in their hands and tear it to pieces with their teeth, or cut it with a small knife which each carried in his girdle."

Bread also was never cut at table. In former times it was not baked so thick as at present, but rather like cakes, and could easily be broken; hence mention is so often made of the "breaking of bread." The Chinese never use forks, but they have small sticks of ivory (called chopsticks), which are often of very fine workmanship, and inlaid with silver and gold. Two of these are placed before each guest, who uses them for putting into his mouth the meat which has been cut into small bits.

Had the Romans used forks they must necessarily have been found among the numerous remains of antiquity which have been collected in modern times. But Baruffaldi and Biornstahl, who both made researches respecting them, assure us they were never able to find any. Count Caylus and Grignon assert the contrary. The former has given a figure and description of a silver two pronged fork, which was discovered among rubbish in the Appian Way. It is of exceedingly beautiful workmanship, and at one end terminates in a stag's foot. Beckmann says: "Notwithstanding the high reputation of this French author, I cannot possibly admit that everything of which he has given figures is so old as he seems to imagine."

Grignon found in the ruins of a Roman town in Champagne some articles which he considers as table forks, but he merely mentions them, without giving a description sufficient to convince one of the truth of what he asserts, which, in regard to a thing so unexpected, was certainly requisite. One fork was of copper or brass, two others were of iron, and he says, speaking of the latter, that they seemed to have served as table forks, but were coarsely made. It is, however, doubtful if he conjectured rightly in regard to the use of them. As far as Beckmann knows, the use of forks was first known in Italy toward the end of the fifteenth century, but at that time they were not very common. Galeotus Martius, an Italian resident at the court of Matthias Corvinus, King of Hungary, who reigned from 1458 to 1490, relates in a book which he wrote about that prince, that in Hungary at that time forks were not used at table, as they were in many parts of Italy, but that at meals each person laid hold of the meat with his fingers, and on that account they were much stained with saffron, which was then put into sauces and soup. He praises the king for eating without a fork, yet conversing at the same time, and never dirtying his clothes.

Thomas Coryate, the traveler, saw them used in Italy, and in the same year used them himself in England. He says, in his book called the "Crudities:" "Here j will mention a thing that might have been spoken of before in discourse of the first Italian towne. J observed a custome in all those Italian cities and townes through the which j passed that is not used in any other country that j saw in my trfvels; neither do j thinke that any other nation in Christendome doth use it, but only Italy. The Italian, and also most strangers that are commorant in Italy, do alwaies at their meales use a little forke when they cut their meate. For while with their knife, which they hold in one hand, they cut the meate out of the dishe, they fasten their forke, which they hold in their other hand, upon the same dishe; so that whatsoever he be that, sitting in the company of any others at meale, should unadvisedly touch the dishe of meat with his fingers from which all at the table doe cut, he will give occasion of offence unto the company, as having transgressed the lawes of good manners, insomuch that for his error he shall be at least brow beaten, if not reprehended in wordes. This form of feeding j understand is generally used in all places of Italy; their forkes being, for the most part, made of yron or steele, and some of silver, but those are used only by gentlemen. The reason of this their curiosity is, because the Italian cannot, by any meanes, indure to have his dishe touched with fingers, seeing all men's fingers are not alike cleane. Hereupon j myself thought good to imitate the Italian fashion by this forked cutting of meate, not only while j was in Italy, but also in Germany, and oftentimes in England since j came home, being once quipped for that frequent using of my forke by a certain learned gentleman, a familiar friend of mine, one Mr. Laurence Whitaker, who, in his merry humor doubted not to call me at table *furcifer*, only for using a forke at feeding, but for no other cause."

The use of forks was at first much ridiculed in England as an effeminate piece of finery; in one of Beaumont and Fletcher's plays, "your fork carving traveler" is spoken of with much contempt; and Ben Jonson has joined in the laugh against them in "Devil's an Ass," Act V., Scene 4. Meercraft says to Gilthead and Sledge:

> Have I deserved this from you two? for all
> My paine at court, to get you each a patent.
> *Gilthead:* For what?
> *Meercraft:* Upon my project of the *forks.*
> *Sledge: Forks?* What be they?
> *Meercraft:* The laudable use of forks,
> Brought into custom here as they are in Italy
> To the sparing of napkins.

In many parts of Spain at present, drinking glasses, spoons and forks are rarities; and in taverns in many countries, particularly in some towns of France, knives are not placed on the table, because it is expected that each person should have one of his own; a custom which the French seem to have retained from the old Gauls. But as no person would any longer eat without forks, landlords were obliged to furnish these, together with plates and spoons.

Dr. Johnson writes: "Among the Scotch highlanders knives have been introduced at table only since the time of the Revolution. Before that period every man had a knife of his own as a companion to his dirk or dagger. The men cut the meat into small morsels for the women, who then put them into their mouths with their fingers. The use of forks at table was at first considered as a superfluous luxury, and therefore they were forbidden to convents, as was the case in regard to the congregation of St. Maur."

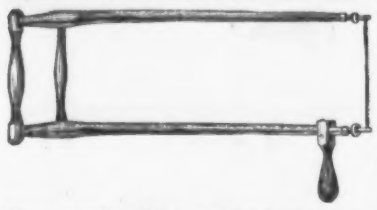
The English, Dutch and French have adopted the Italian names *forca* and *forchetta*, given to our table forks, though these appellations, says Beckmann, in his opinion, were used at an earlier period to denote large instruments, such as pitchforks, flesh forks, furnace forks, because in the low German *forke* is a very old name given to such implements. The German word *gabel*, which occurs first in dictionaries for these large instruments, is of great antiquity, and has been still retained in the Swedish and Dutch. It appears to have been used for many things which were split or divided into two; at any rate, it is certain that it is not derived from the Latin work *gabalus*.

None of the sovereigns of England had forks till the reign of Henry the Eighth; all, high and low, used their fingers. Hence in the royal household there was a dignitary called the Ewrar or Ewary, who with a set of subordinates attended at meals with basins, water and towels. The office of Ewary survived after forks came partially into fashion. We learn that when James the First entertained the Spanish Ambassador at dinner, very shortly after his accession, "their Majesties washed their hands with water from the same ewer, the towels being presented to the King by the Lord Treasurer, and to the Queen by the Lord High Admiral." The prince of Wales had a ewer to himself, which was after him used by the ambassador.

About the first royal personage in England who is known to have had a fork was Queen Elizabeth, but, although several were presented to her, it remains doubtful whether she used them on ordinary occasions. From the inventory of Her Majesty's appointment in "Nichol's Progresses," it would appear that these forks were more for ornament than use: "*Item*, a knife and a spoune and a forke of christall, garnished with golde sleightly and sparcks of garnetts, given by the Countess of Lincolne. *Item*, a forke of corall sleightly garnished with golde, given by Mrs. Frances Drury. *Item*, one spoune and forke of golde, the forke garnished with lyttle rubyes, two lyttle perles pendant and a lyttle corall, given by the Countess of Warwicke." These ornamental forks had doubtless been presented to the queen as foreign curiosities of some value, and were probably never used at table. As yet, and for a considerable time afterward, forks were not in common use, a circumstance less attributable to ignorance of their invention than prejudice. So far was this prejudice carried by even educated persons, that one divine preached against the use of forks, as being an insult to Providence not to touch one's meat with one's fingers. Forks came so slowly into use in Europe, that they were employed only by the higher classes at the middle of the seventeenth century. And even toward its close, few noblemen had more than a dozen forks of silver, along with a few of iron or steel. At length for general use, steel forks were manufactured. These had but two prongs, and it was only in later times that the three pronged kind were made. In the early part of the eighteenth century, table forks, and, we may add, knives were kept on so meagre a scale by country inns in Scotland (and perhaps in some parts of England), that it was customary for gentlemen in traveling to carry with them a portable knife and fork in a shagreen case. The general introduction of silver forks is quite recent; it can be dated no further back than the year 1814. The extensive use of these costly instruments in the present age marks, in an extraordinary degree, the rapid progress of wealth and refined taste throughout the civilized world. No laboring man even of the present day would consider his table complete without his three-pronged forks. The silver fork or prong has now grown into four divisions, and to such perfection has the manufacture of silver and silver plated goods been brought in America, that foreign made articles are seldom, if ever, imported.

About a year ago a glass manufacturing firm in this city received an order from Germany for pressed glassware, which was intended to fill an order received by a house in that country from South America. We do not know whether the Pittsburgh firm has received any more such orders or not, but the question presents itself, why do not our manufacturers of pressed glassware open up markets for themselves, and ship direct to those who want their ware? In short, why do any of our manufacturers complain of "overproduction" and "limited demand" while there are so many inviting markets beyond the borders of our own country.—*American Manufacturer.*

It is something new to hear of Massachusetts exporting her print cloths to the English markets; but this is what the Fall River manufacturers are now doing. With the home market glutted and prices ruinously low, they did not idly wait for better times, but sent an agent to England to see if something could be done there. The reports received have been so far satisfactory that 30,000 pieces of print cloths have already been sent over on orders, and arrangements have been made, it is stated, for the regular sale of American prints in the London market. The prices obtained are not high, but they are enough to pay a small profit on the cost of production, which the rates ruling in our own markets will not give. It speaks well for the enterprise of the Massachusetts manufacturers that they can place their goods in markets which have always been regarded as the exclusive possession of their English rivals; but that they should have to send them abroad to get even the smallest profit is a striking evidence of the depressed condition of home trade.—*N. Y. Times.*



We wish to call the special attention of merchants to this

PATENT

BRACKET SAW FRAME.

We have never before made anything which sold so readily, and gave such universal satisfaction.

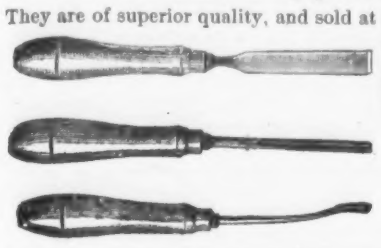
Where one is sold in a neighborhood, it makes a demand for many more. We have now sold 40,000 of them and have not yet heard one complaint, but we have a large number of letters expressing great satisfaction with them. We have advertised them largely and thereby created a demand in every part of the country.

The list price of Rosewood Frames is $1·25 each, and of Birch $1·00 each, with the same discount that we make on our Barber Bit Braces. Price of Saw Blades, $1·20 per gross net.

We also make sets of

CARVING TOOLS.

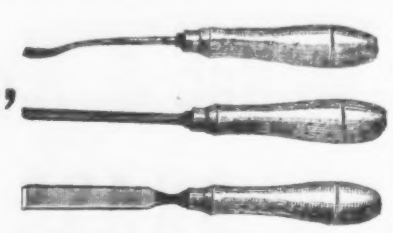
Price of the three tools in nice paper box $1·00, discount 25 per cent. to the trade. These tools are sharpened and fitted for work. They are of superior quality, and sold at a lower price than imported tools.



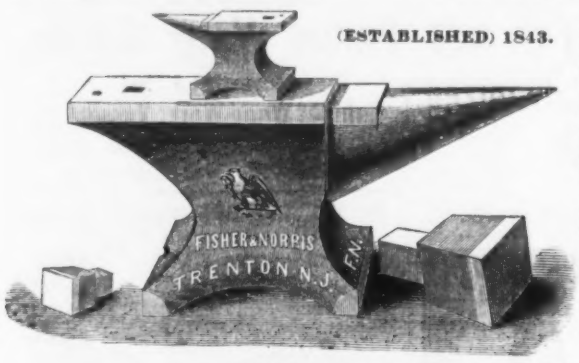
Millers Falls Co.,

No. 78 Beekman Street,

NEW YORK.



THE EAGLE ANVIL !!WARRANTED!!



(ESTABLISHED) 1843.

These Anvils are *superior* to the best English, or other Anvils, on account of the peculiar process of their manufacture (invented and used only by this concern), and from the quality of the materials employed.

The best English Anvils become hollowing on the face by continued hammering in use, on account of the fibrous nature of the wrought iron—causing it to "settle" under the face.

The body of the Eagle Anvils is of crystallized iron, and no settling can ever occur; the steel face, therefore, remains perfectly true. Also, it has the great advantage, that being of a more *solid* material, and consequently with less rebound, the piece forged receives the full effect of the hammer, instead of a part of it being wasted by the rebound, as of a wrought iron anvil. An equal amount of work can, therefore, be done on this Anvil with a *hammer one-fifth lighter* than that required when using a wrought iron anvil.

The working surface is in *one piece* of JESSUP'S BEST TOOL CAST STEEL, which, being accurately ground, is hardened and given the proper temper for the heaviest work. The *horn* is covered with and its extremity made *entirely of steel*. The body of the Anvil is of the strongest grade of American iron, to which the cast steel face is *warranted to be thoroughly welded and not to come off*.

☞ **NEW PRICE LIST.** ANVILS of 100 lbs. to 600 lbs., 10c. per lb.

Small Anvils, ("Minims.")

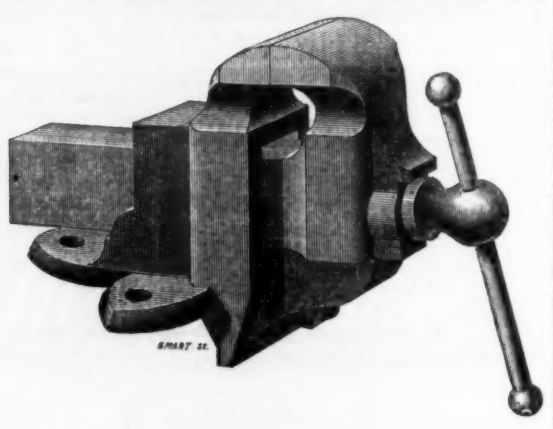
	No. 00	0	1	2	3	4	5	6	7	8	9
Weighing about	10 lb.	15 lb.	20 lb.	30 lb.	40 lb.	50 lb.	60 lb.	70 lb.	80 lb.	90 lb.	
	$2·50	$3·20	$3·75	$4·50	$5·00	$5·90	$6·75	$7·25	$8·10	$9·00	$9·50

THESE GOODS ARE SOLD BY THE GENERAL AGENTS (with special discounts to the trade).

New York.—Messrs. J. CLARK WILSON & CO.—RUSSELL & ERWIN MFG. CO.—Messrs. HORACE DURRIE & CO. Boston.—Messrs. GEORGE H. GRAY & DANFORTH. Philadelphia.—Messrs. JAMES C. HAND & CO. Baltimore.—Mr. W. H. COLE. Louisville.—Messrs. W. B. BELKNAP & CO.

FISHER & NORRIS, Sole Manufacturers, Trenton, N. J.

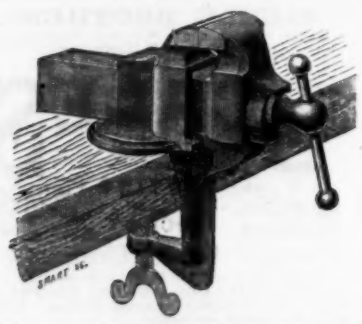
Simpson's Adjustable Parallel Vises.

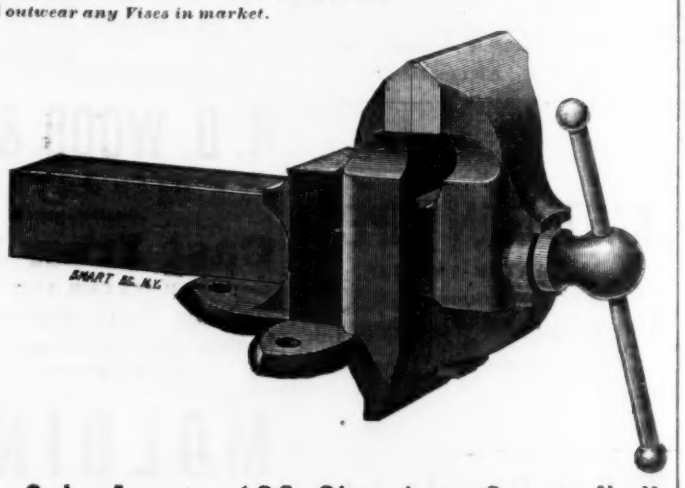


The jaws can be *instantly opened or closed the full length*, by one movement of the hand, *without the use of the screw*.

They combine the QUICK ADJUSTMENT with all the advantages of the best Screw Vises, holding the work with as *slight* or *firm* a grip as may be desired, *without any liability to jar or work loose, as is the case with other adjustable vises.*

The Screw being used merely to give the grip, they will outwear any Vises in market.





Their extreme simplicity constitutes one of their strongest recommendations.

☞ **Send for Price List.**

BAILEY WRINGING MACHINE CO., Sole Agents, 106 Chambers Street, N. Y.

HOWARD PARALLEL BENCH VISE.

MANUFACTURED BY

Howard Iron Works,

Send for price list. Buffalo, N.Y.

RUSSELL & ERWIN MFG. CO. NEW YORK & PHILADELPHIA AGENTS.

H. A. ROGERS,

BOX 4106. 19 John Street, NEW YORK.

SUPPLIES, in every variety,

For Railroads, Mills and Manufacturers.

Send for new Illustrated Catalogue, 272 pages.

STAFFORD MANUFACTURING CO.'S
Stencil Combinations.

Containing: Stencil Alphabet, Figures, Can Stencil Ink and Brush.

For marking boxes, barrels, bags, and packages for shipment. Printing all manner of showcards, notices, signs, numbers, prices, &c., and other purposes too numerous to mention. Instructive and amusing for boys.

WHOLESALE PRICES.

Size.		Size.	
⅜ in., per dozen	$6·00	1⅜ in., per dozen	$10·00
¾ " "	6·50	2 " "	12·00
1 " "	7·00	2½ " "	18·00
1¼ " "	9·00	1⅝ " with lower case	15·00

An Illustration of sizes sent on application.

For sale by Hardware Dealers and Stationers.

No. 66 Fulton Street, New York.

MACK & CO.

Successors to

D. R. BARTON & CO.,

At the Old Stand, 136 Mill St., ROCHESTER, N Y

Sole Manufacturers of the

D. R. BARTON & CO. BRAND OF

Carpenters' Coopers' and Pump Makers' TOOLS.

Large Knives and Barrel Machinery.

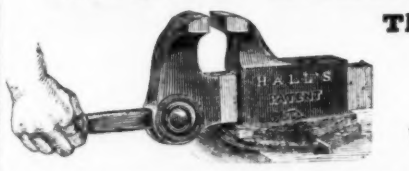
All Tools made by us are stamped D. R. BARTON & CO.,

All goods stamped **D. R. Barton & Co.**, are made at the Old Works, and by the old men, from the Be English Steel, manufactured for us by Thos. Firth & Sons and Wm. Jesson & Sons, and fully warranted.

Goods stamped **D. R. Barton** are not made at the Old Works of the compan but by a new stock company formed about the time of Mr. Barton's decease.

GET THE BEST.

HALL'S Sudden Grip VISE.



The Quickest,

Most Convenient, and

Most Complete

VISE ever devised.

A Push closes and grips. A pull opens the jaws to any extent. The Swivel is Automatic, will swing on the table to any angle and fasten itself. Made in the best manner of the best material. Send for a Circular. **AGENTS WANTED.** *Address,*

THOMAS HALL,

411 Fulton Street, - - - BROOKLYN, N. Y.

Manufactured by CHARLES PARKER, Meriden, Conn.

IRON BLOCK PLANE.

No. 110. 7 1-2 Inches Long, 1 3-4 Inch Cutter, $9·00 per dozen.

STANLEY RULE AND LEVEL COMPANY, Manufacturers,

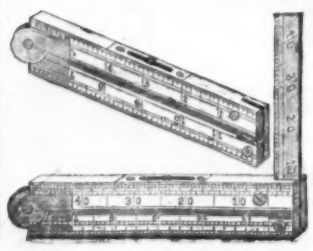
Factories, New Britain, Conn. Warerooms, 35 Chambers St., N. Y.

STEPHENS & CO.,

Manufacturers of

U. S. Standard Boxwood and Ivory RULES.

Also Exclusive Manufacturers of



L. C. STEPHENS' PATENT COMBINATION

RULE.

Riverton, - - - - Conn.

Boxwood and Ivory Rules having been our specialty for over twenty years, we guarantee the uniform excellence which has always characterized our goods.

Price Lists on application.

Forehand & Wadsworth's Double-Action

WROUGHT IRON FRAME.
Cast Steel Barrel and Cylinder.
32, 38 and 41 Cal.

SOLE AGENTS,

SCHOVERLING & DALY,

84 & 86 Chambers Street, New York.

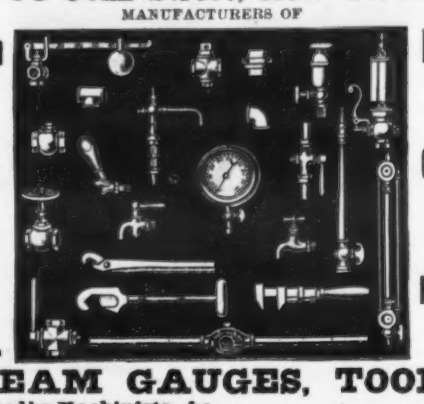
Manufacturers of Standard and O. K. Revolvers, Charles Daly Guns. Agents for Wesson & Harrington, J. P. Clabrough & Bro. Importers of **Guns, Gun Material, &c.**
Illustrated Catalogue furnished to only those whom we know to be in the trade.

EATON, COLE & BURNHAM CO.,

58 John Street, New York.

MANUFACTURERS OF

Wrought Iron **PIPE,** Cast Iron FLANGED PIPE, **Cast Iron** RADIATORS and BOILERS.



Brass & Iron **STEAM** Gas & Water FITTINGS. PLUMBERS' MATERIALS.

STEAM GAUGES, TOOLS,
and all Supplies used by Machinists, &c.

THE SELDEN DIRECT-ACTING
STEAM-PUMP
PAT. AUG. 2, 1870. DECEMBER 20, 1870
AND OCT. 21, 1873
COMBINING SIMPLICITY AND DURABILITY TO A REMARKABLE DEGREE. ITS PARTS ARE EASY OF ACCESS AND IT IS ADAPTED TO ALL PURPOSES FOR WHICH STEAM PUMPS ARE USED
A. CARR
MANUFACTURER AND PROPRIETOR,
43 CORTLANDT ST. NEW YORK.

The National Steel Tube Cleaner.

Patented July 28, 1874.

Guaranteed to clean better, last longer and work easier than any in the market. Removes all Carbon and Scale from the Boiler Tubes. Adopted and in use by United States Navy. For sale by dealers.
THE CHALMERS SPENCE CO., Foot East 9th St., N. Y., Agents for the United States.

Tredegar Horse and Mule Shoes.

These superior Shoes are made of the Best Virginia Charcoal Iron. They are well adapted to Western and Southern demand, and are shipped to all prominent markets at freights as low as on other makes.

THE TREDEGAR COMPANY, Manufacturers,
Tredegar Iron Works, Richmond, Va.

SEMPLE, BIRGE & CO., Sole Western Agents, ST. LOUIS, MO.

Two First Premiums awarded by Franklin Institute Exhibition of 1874.

C. VAN HAAGEN & CO.,

2341 and 2343 Callowhill Street, PHILADELPHIA, PA.

Manufacturers of Latest Improved Machine Tools, Rotary Shapers, two sizes, Iron Planers, all sizes, Horizontal Drill Attachments, for upright power drills, Self-feeding Portable Drills, hand or power, Expansion Boring Bars, five sizes, Universal Slide Rest, for taper work, Twist Drill Sharpening Machines, automatic and adjustable in every direction, Noiseless Friction Gears, for transmitting up to thirty horse-power.
Send for Descriptive Circulars.

GOLD MEDAL
Non-Extensible Razor Belt.

PATENTED JULY 25, 1871.
RE-ISSUED MAY 13, 1873, and JUNE 9, 1874.

In this Strap the liability of the leather to stretch and become loose and porous is prevented by the a patented non-extensible base, which supports the leather and secures

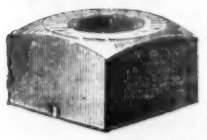
PERMANENT ELASTICITY.

We make this style with single rod, double rod, and wood frames, and intend that it shall, in quality compare favorably with our other well known brands.

BENJAMIN F. BADGER & SON, Manufacturer,
Badger Place, Charlestown, Mass.

NEW HAVEN NUT CO.,

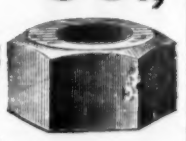
MANUFACTURERS OF



HOT PRESSED NUTS

Of Superior Quality of all sizes, both

HEXAGON & SQUARE,



From ¼ inch to and including 1½ inch Bolt.

Factory and Office. - - - - - - WESTVILLE, CONN.

Pipe, Fittings, &c.

WROUGHT IRON
INDESTRUCTIBLE ENAMELED PIPE

For Water, Gas, Sewage & Soil Pipe.

Manufactured Solely by

NATIONAL TUBE WORKS CO.,

Also Lap Welded Steam & Gas Pipe & Boiler Tubes.

Tubing & Casing for Artesian, Oil & Salt Wells (with Patent Protecting Coupling).

A Specialty made of Large Wrought Iron Lap Welded Tubes, 8 in. to 14 in. diameter.

MACK'S PATENT INJECTOR, ETC.

Works and Offices at BOSTON, MASS., and McKEESPORT, PENN.

OFFICES AND WAREHOUSES,

New York, 78 William Street. Chicago, 112, 114 & 116 Lake Street.
Cincinnati, 119, 121 & 123 Pearl Street. St. Louis, 811, 813, 816 N. Main Street.

McNab & Harlin Mfg. Co.,

MANUFACTURERS OF

BRASS COCKS

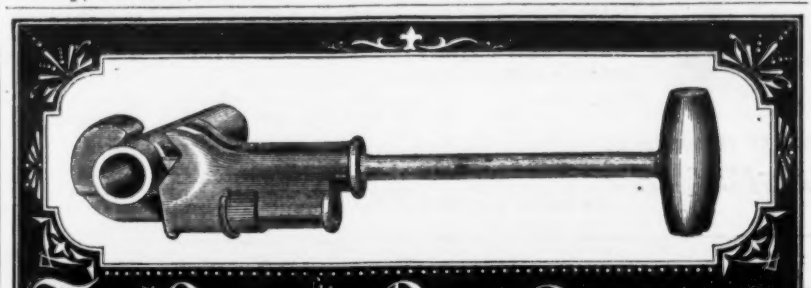
For STEAM, WATER and GAS.

Wrought Iron Pipe & Fittings, Plain and Galvanized

PLUMBERS' MATERIALS.

Illustrated Catalogue sent by express to the Trade on application.

Factory, Paterson, N. J. 56 John Street, N. Y.



The Acme Pipe Cutter.

MADE ENTIRELY OF SOLID CAST STEEL.

Cuts Wrought Iron, Brass and Copper Pipes, Round Iron &c perfectly true without leaving burr on pipe contracting or splitting it. Cuts out a chip similar to a lathe tool. The knife may be removed and ground. Send for descriptive circular to manufacturers.

Pancoast and Maule
PHILADELPHIA PA.

WM. ESTERBROOK,
Wholesale Manufacturer of
Coal Hods,
FIRE SHOVELS, Etc.
311 Cherry St., PHILADELPHIA.

CAST IRON PIPES

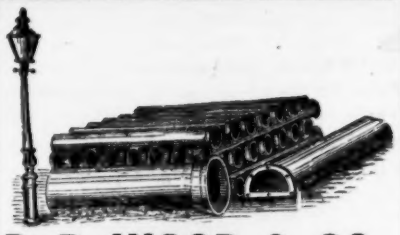
FOR WATER AND GAS.
Branches Retorts, &c.
Warren Foundry & Machine Co.,
PHILLIPSBURG NEW JERSEY.

GEORGE BARNES & CO.,

Manufacturers, Syracuse, N. Y.

TRANSFER ORNAMENTS

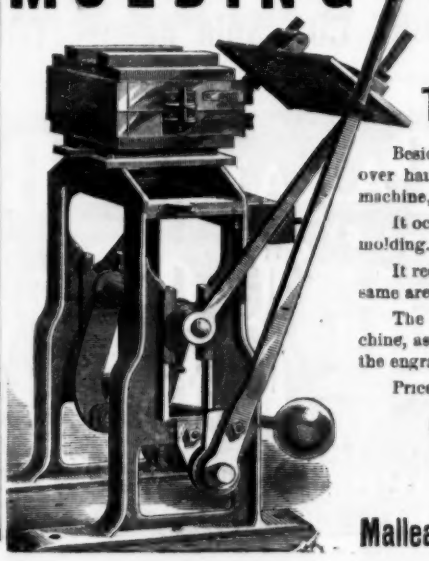
For Tin, Japan Ware, Safe and Carriage Manufacturers, Etc. For sale by
JULIUS FECHTELER, 104 John St., N. Y.
I sell my Carriage Ornaments to dealers only.



R. D. WOOD & CO.,

Philadelphia,
Manufacturers of
Cast Iron Pipe
FOR WATER AND GAS.
Lamp Posts, Valves, &c.,
Mathew's Pat. Anti-Freezing Hydrants.
400 CHESTNUT STREET.

MOLDING MACHINE,



New and Improved.

T. F. HAMMER'S PATENT.

Beside all advantages Molding Machines possess over hand molding, it is especially claimed for this machine, that:

It occupies no more room than a bench for hand molding.

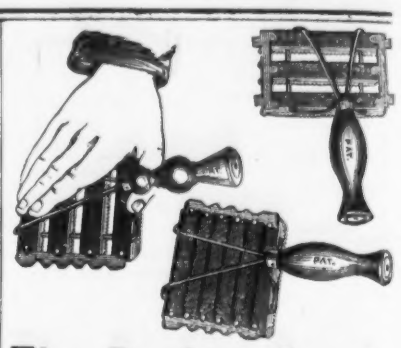
It requires no special flasks or boards, but the same are used as for hand molding.

The light is not obstructed by any part of the machine, as the pressure plate is swung back as shown in the engraving.

Price List on application.

T. F. HAMMER,
Branford, Conn.

Malleable Iron Castings made to Order.



The Perfect Comb.

We call your attention specially to our new patent endless wire frame comb. The result of a long series of experiments, made with a view to meeting all the requirements of a *Perfect Comb*. It is better, stronger, and more durable than any ever before invented. The raised wire shank gives what has never before been attained, viz: a rest and brace for the thumb, in such a position that the hand cannot come in contact with the horse while using the comb. The wire braces which run from the shank over the back to the front teeth give strength and durability in a direction never heretofore attained, and at the same time serve as an extra handle; and when clasped by the fingers in connection with the raised shank the comb is more firmly, easily, and completely held, and with much less fatigue to the hand than is possible in any other formation—in short, it needs but a trial to vindicate a name: **The Perfect Comb.**

THE LAWRENCE COMB CO.
Factory and Office,
382 2d Ave., cor. 22d St., N. Y.

WM. S. CARR & CO.

Sole Manufacturers of
CARR'S
Patent Water Closets,
PUMPS,
Cabinet Wood Work, Vases, &c
100, 108 & 110 Centre Street,
Factory, Mott Haven, New York.

EDWARD BARR,

78 John Street, NEW YORK.
Tubes for Gas, Steam & Water
1-16 to 48 inch. **Gas, Steam Fitters', Plumbers' and Machinists' Supplies.** Boiler Tubes, Iron and Steel Boiler Plates, Rivets, Tools, Etc. Railroad Cars and all kinds of Railway Supplies. Iron and Wood Work for Cars, Bridges and Buildings.
Agent for W. C. ALLISON & SONS.

J. AUSTIN & CO.,

168 Fulton Street, N. Y.,
Proprietors and Manufacturers of
WHEATCROFT'S SELF-ADJUSTING

Pipe Wrench,

AND
Scripture's Funnel Top
MACHINE OILERS.
Dealers in
STEAM AND GAS FITTERS TOOLS.

RIEHLE BROTHERS,
N. Ninth Street, above Master, Philadelphia.
New York Store, 96 Liberty Street.
Pittsburgh Store, 235 Liberty Street.

SCALES

SCALE AND TESTING MACHINE WORKS
PHILADA ESTABLISHED 1848

"Patented" Furnace Charging Scale.
Double Beam R. R. Track Scale, Compound Parallel Crane Beams, &c. Patented First Power Lever Wagon Scales. Testing Machines any capacity.
Send for Illustrated Price List.

The Iron Age Directory

and Index to Advertisements.

PAGE.

Alarm Whistles and Speaking Tubes.
Fredricks C. A., 83 Fulton, N. Y. 2
Ostrander W. R. 19 Ann, N. Y. 2

Agricultural Steels and Irons, etc., *Makers of.*
Nellis, A. J. & Co., Pittsburgh, Pa. 40

Alarm Tills.
Tucker & Dorsey, Indianapolis, Ind. 34

Animal Poke s
Bishop & Benedict, Berea, O. 12

Anvils, *Manufacturers of.*
Fisher & Norris, Trenton, N. J. 25

Augers, Bits, etc., *Manufacturers of.*
Clark Wm. A., Westville, Conn. 18
Edward Phelan, 113 Chambers N. Y. 6
The Conn. Valley Mfg. Co., Centerbrook, Conn. 8
The Douglass Mfg. Co., 63 Reade, N. Y. 9

Axes, Edge Tools, &c., *Manufacturers of.*
Francis Axe Co., Buffalo, N. Y. 31
Jones, M. H. & Co., Cohoes N. Y. 12
Mack & Co., Rochester, N. Y. 25

Axles, Springs, etc., *Manufacturers of.*
Brown D. Arthur & Co., Fisherville, Concord, N. H. 14
Spring Perch Co., Bridgeport, Conn 18
Tomlinson Spring & Axle Co., Bridgeport, Conn. 12
Hotchkiss Guy C., Field & Co., Brooklyn, E. D. 35
Wentworth B M. & Co., Gardiner, Me. 12

Axle Grease. *Makers of*
Fraser Lubricator Co., 104 Maiden Lane, N. Y. 39

Band Saws and Tools for Brazing &c., *Importers of.*
Gueutal George & Son, 39 W. 4th, N. Y. 10

Bed Screws. *Maker of.*
Shelton Co., Birmingham, Conn. 34

Bellows. *Manufacturers of.*
Churchyard, Joseph, Buffalo, N. Y. 37
Newcomb Bro's., 686 Water, N. Y. 37
Scott Geo. M., Chicago, Ill. 37

Bells
Baltimore Bell and Brass Works, 53 and 55 Holliday, Baltimore, Md. 12
Williams E. A. & Son, 107 Plymouth, Jersey City, N. J. 3

Boiler Cleansing Compound.
Lord George W., 237 Arch, Phila. 6

Belting, Leather. *Makers of.*
Alexander Bros., 412 N. 3d., Phila. 33

Bird Cages, *Makers of.*
Lindeman O. & Co., 254 Pearl, N. Y. 4
Maxheimer John, 249 Pearl, N. Y. 23
Osborn Mfg. Co. 79 Bleecker, N. Y. 8

Bit Braces *Manufacturers of.*
Miller's Falls Mfg. Co., 78 Beekman, N. Y. 25

Boiler Felting.
Radcliffe S., 206 West, N. Y. 37

Bolt Machinery.
American Bolt Co., Lowell, Mass. 13

Brass Butts. *Makers of*
Tiebout W. J., 240 Pearl, N. Y. 12

Brass. *Manufacturers of.*
Ansonia Brass and Copper Co. 19 Cliff, N. Y. 2
Baltimore Bell and Brass Works, 53 and 55 Holliday, Baltimore, Md. 12
Benedict & Vose 99 Chambers, N. Y. 2
Bridgeport Brass Co., 62 John, N. Y. 2
Davol John & Sons, 100 John, N. Y. 2
Holmes, Booth & Haydens 49 Chambers, N. Y. 4
Hickcox Mfg. Co., 230 Pearl, N. Y. 3
Manhattan Brass Co. 83 Reade, N. Y. 2
Miller Edw. & Co., 4 Warren, N. Y. 2
Phoenix Brass and Iron Foundry, Allentown, Pa. 4
Plume & Atwood Mfg. Co., 80 Chambers, N. Y. 2
Scovill Mfg. Co., 421 Broome, N. Y. 2
The Wilmot Mfg. Co., 50 Barclay, N. Y. and 96 John, Bridgeport, Conn. 2
Waterbury Brass Co. 52 Beekman N. Y. 2

Brick Presses. *Makers of*
Carnell Geo., 1819 Germantown Ave., Phila. 28
Carnell F. L. & D. R., 1844 Germantown Ave., Phila. 28
Schantz Marcus Perth Amboy, N. J. 28

Bridge Builders.
Moseley Iron Bridge and Roof Co., 5 Dey, N. Y. 5
Leighton Bridge and Iron Works, Rochester, N. Y. 15

Butcher and Shoe Knives. *Manufacturers of.*
Wilson John, Shemield, England. 33

Butts and Hinges. *Makers of.*
American Butt Co., Providence, R. I. 34
American Spiral Spring Butt Co 82 Beekman, N. Y. 40
Crooke & Co., 163 Mulberry, N. Y. 26
House Bros., 194 Broadway, N. Y. 35
Shepard John D., Buffalo, N. Y. 3
Union Mfg. Co., 99 Chambers N. Y. 7
Western Butt Co., St. Louis, Mo. 7

Carriage Bolts. *Makers of.*
Townsend, Wilson & Hubbard, Phila. 17

Carriage Hardware, *Makers of.*
Smith H. D. & Co., Plantsville, Ct. 16

Car Wheels, etc., *Manufacturers of.*
Taylor Iron Works, High Bridge, N. J. 6

Chemical and Physical Instruments.
Hall & Harbeson, 191 Greenwich, N. Y. 26

Chisels. *Manufacturers of,*
Buck Bros., Millbury, Mass. 3
Mack & Co., Rochester, N. Y. 25

Chilled Rolls.
Phœnix Brass and Iron Foundry, Allentown, Pa. 4

Coal. *Miners of.*
Pardee A. & Co., 111 Broadway, N. Y. 8

Coal Vases.
Sidney Shepard & Co., Buffalo, N. Y. 31

Coal Hods. *Manufacturers of.*
Easterbrook Wm., 311 Cherry, Phila. 26

Coffee and Spice Mills.
Lane Brothers, Millbrook, N. Y. 10
Enterprise Mfg. Co., Philadelphia, Pa. 34

Compasses and Dividers. *Manufacturers of*
Bemis & Call Hardw. & Tool Co., Springfield, Mass. 12

Cooper's Tools, etc., *Dealers in.*
Little Chas. E., 39 Fulton N. Y. ..... 10 and 11

Corrugated Iron.
Moseley Iron Bridge and Roof Co., 5 Dey, N. Y. 5

Crucibles, *Manufacturers of.*
Strow, Wile & Co., 709 Market, Phila. 35

Curry Combs. *Manufacturers of.*
Boker Hermann & Co., 101 and 103 Duane, N. Y. 35
Cassell I. N., Fredericktown, O. 36
Fuller Brothers, 99 Chambers St., N. Y. 35
Kellogg Wm. P. & Co., Troy, N. Y. 36
Lawrence Curry Comb Co., 382 3d Avenue, N. Y. 25

Cutlery, *Importers of.*
Boker Hermann & Co., 101 Duane, N. Y. 35
Clatworthy F. & W., 82 Chambers, N. Y. 11
Fisher Jos. S., 411 Commerce, Phila. 11
Friedmann & Lauterjung, 14 Warren, N. Y. 11
Ring, Briggs & Co., 80 Chambers, N. Y. 11
Marx Emanuel, 106 Chambers, N. Y. 11
Rogers & Bro., 203 Broadway, N. Y. 11
Ward Asline, 101 Duane, N. Y. 11
Wilson Hawksworth, Ellison & Co., 72 John, N. Y. 32

Cutlery, *Manufacturers of.*
Burchinow Aaron, Pepperell, Mass. 11
Furness Bannister & Co., Newark, N. J. 11
Lamson & Goodnow Mfg. Co., 58 Chambers, N. Y. 11
Meriden Cutlery Co., 49 Chambers, N. Y. 11
Miller Bros. Cutlery Co., W. Meriden, Conn. 11
Naugatuck Cutlery Co., 89 Chambers, N. Y. 11
Northampton Cutlery Co., 45 Murray, N. Y. 11
New York Knife Co., Walden, N. Y. 11

Diamond Tool's.
Dickinson J., 64 Nassau, N. Y. 37

Door Alarm *Makers of.*
F. Blakemore, 3425 Market, Philadelphia 26

Door and Gate Springs.
Quackenbush, Townsend & Co., 59 Reade, N. Y. 34
Van Wagoner & Williams, 82 Beekman, N. Y. 40

Door Knobs. *Makers of*
The Parker & Whipple Co., 97 Chambers, N. Y. 34

Dredging, *and Makers of Dredging Machines.*
Am. Dredging Co., 10 S. Delaware ave., Phila. 39

Drill Chucks. *Manufacturers of.*
Lambertville Iron Works, Lambertville, N. J. 37

Drilling Machines, *Makers of.*
Thorne, DeHaven & Co., Philadelphia 38

Drop Forgings.
Billings & Spencer Co., Hartford, Ct. 35
Hammond H. & Co., Hartford, Conn. 8
The Hull & Belden Co., Danbury, Conn. 7

Edge Tools, *Makers of.*
Mack & Co., Rochester, N. Y. 25
Weed N., 4 and 6 Gold, N. Y. 34

Elevators. *Makers of.*
Crane Bros. Mfg. Co., Chicago, Ill. 9
Hoisko Machine Co., 279 Cherry, N. Y. 5
Whittier Machine Co., 1176 Tremont, Boston, Mass. 34
Otis Bros. & Co., 348 Broadway, N. Y. 9

Emery.
Geo. H. Gray & Danforth, Boston, Mass 36
Int. Union Stone Co., 6 Exchange, Boston. 37

Emery Cloth.
The Union Stone Co., 6 Exchange, Boston. 37

Emery Wheels. *Makers of.*
Brady Mfg. Co., 240 Plymouth, Brooklyd, N. Y. 37
The Union Stone Co., 6 Exchange, Boston. 37

Engineers, Machinists, etc.,
Hall Edward J. Jr., 452 Franklin, Buffalo, N. Y. 6
Henshall James, 1056 Beach, Phila 37
Moore James, cor. 16th and Buttonwood, Phila. 36
Ohl & Hauschild, 57 to 67 Passaic Ave., E. Newark, N. J. 13

Engines, Steam. *Makers of.*
Hartford Foundry and Machine Co., Hartford Ct. ... 10
Lovegrove & Co., 121 South 4th, Phila. 34
Seaver & Wells, Binghamton, N. Y. 29
Tully A. C. & Co., 57 Dey, N. Y. 30
Utica Steam Engine Co., Utica, N. Y. 29

Engravers.
Collins, Geo. B. 19 Warren, N. Y. 13

Faucets, Brass, *Makers of.*
McNab & Harlin Mfg. Co., 56 John, N. Y. 26

Faucets, *Self-Measuring, Makers of*
Eaterurlae Mfg. Co., of Pa., Phila. and N. Y. 34

Files, *Importers of.*
Carr J. & Riley 82 John, N. Y. 32
Fisher Joseph S., 411 Commerce, Phila. 11
Frasse Peter A. & Co. 95 Fulton, N. Y. 8
Moss F. W., 80 John, N. Y. 32
Sanderson Bros. & Co., 16 Cliff, N. Y. 32
Spear & Jackson, 116 Duane, N. Y. 36

Files, *Manufacturers of.*
Adamantine File Works, Providence, R. I. 18
American File Co., Pawtucket, R. I. 9
Auburn File Works, 89 Chambers, N. Y. 8
Barnett G. & H. 41 and 43 Richmond, Phila. 8
Draper C. I. & Co., Sing Sing, N. Y. 8
Heller & Bros. Newark, N. J. 8
Hiscox File Mfg Co. Lowell, Mass. 36
Johnson & Bro., 1 Commercial, Newark, N. J. 8
McCaffrey & Bro., 1732 and 1734 N. 4th, Phila 8
Nicholson File Co., Providence, R. I. 28
Paul Chas. B., Williamsburgh, N. Y. 8
Walsh, Coulter & Flagler, 83 Chambers, N. Y. 8

Fire Brick, *Makers of.*
Anness Chas. & Sons, Woodbridge, N. J. 28
Berry Wm. H. & Co., Woodbridge, N. J. 28
Brooklyn Clay Retort and Fire Brick Works, Van Dyke, St., Brooklyn, N. Y. 28
Bell & Bacon, Troy N. Y. 28
Hall A. & Sons, Perth Amboy, N. J. 28
Hall A. & Sons, Buffalo, N. Y. 28
Maurer Henry, 418 East 23d, N. Y. 28
Kreischer B. & Son, 58 Goerck, N. Y. 28
Newkumet Philip, 23d and Vine, Phila. 28
Newton & Co., Albany, N. Y. 28
Valentine M. D. & Bro., Woodbridge, N. J. 28
Watson John R., Perth Amboy, N. J. 28
Weyer Adam, 1683 E. 15th, N. Y. 28

Flint and Emery Paper and Cloth.
Raeder, Adamson & Co. 730 Market, Phila. 6

Flue Cleaners, *Makers of*
The Chalmers Spence Co., foot of E. 9th, N. Y. 26

Forges, Portable, etc.
Empire Portable Forge Co., Troy, N. Y. 35
Place George, (Hurricane) 121 Chambers, N. Y. 9

Forgings.
Johnson J. R., Richmond Va. 37

Foupders and Machinists.
Saml. J. Cresswell Jr., 812 Race, Phila., Pa. 6

Foundry Facings.
Walsh J. P., 121 Chambers, N. Y. 4

Furnaces *Makers of*
Richmond & Potts, 119 S. Fourth, Phila., Pa. 5

Galvanized Iron.
Lefferts Marshall Jr., 90 Beekman, N. Y. 4

Gas Fixtures. *Makers of.*
Bradley & Hubbard Mfg. Co., 21 & 23 Barclay, N. Y. ..40

Gong Bells. *Makers of*
Edw. Sweeney, 4 Duane, N. Y. 36

Governors.
Hartford Governor Co., Hartford, Ct. 39
Huntoon Governor Co., Lawrence, Mass. 40
Junius Judson & Son, Rochester, N. Y. 38
Shive Governor Co., Bethlehem, Pa. 38

Grate Bars.
Vanderbilt Geo., foot W. 19, N. Y. 6

Grindstones.
Wood Walter R., 283 and 285 Front, N. Y. 37
Wortington & Sons, North Amberst, O. 37

Guns, &c
Schoverling & Daly, 84 Chamber St. 26
Windmuller Louis & Roelker, 20 Reade N. Y. 20

Gunpowder, *Makers of.*
Kneeland F. L. (Dupont) 70 Wall, N. Y. 32
Laflin & Rand Powder Co. 21 Park Row, N. Y. 32

Hammers, etc., *Manufacturers of.*
Emmet Hammer Co., Brooklyn, E. D., N. Y. 19
Hammond H. Hartford, Ct. 36

Handles, *Makers of*
N. Carolina Handle Co., 79 Reade, N. Y. 6
Greensboro' Handle Works, 103 Chambers, N. Y. 6

Hardware Commission Merchants.
Graham & Haines, 86 Chambers, N. Y. 34
Keith Edward M., Baltimore, Md. 33
Peck G. Webster, 110 Chambers, N. Y. 6
Walbridge G. B. & Co. 99 Chambers, N. Y. 31
Walsh, Coulter & Flagler, 83 Chambers, N. Y. 8
Wilson J. Clark & Co., 91 Beekman, N. Y. 10

Hardware Dealers.
Betts & Burger, 95 Chambers, N. Y. 18
Lloyd, Supplee & Walton, 625 Market, Phila. 24
Quackenbush, Townsend & Co., 59 Reade, N. Y. 34
Shepard Sidney & Co., Buffalo N. Y. 31
Wilson J. Clark & Co., 91 Beekman, N. Y. 10

Hardware Importers.
Boker Hermann & Co., 101 Duane, N. Y. 35
Field Alfred & Co. 93 Chambers, N. Y. 35
King, Briggs & Co., 80 Chambers, N. Y. 11
Van Wart & McCoy, 134 and 136 Duane, N. Y. 10
Turner R. A., 74 Chambers, N. Y. 4
Windmuller Louis & Roelker 20 Reade N. Y. 20

Hardware Manufacturers.
American Spiral Spring Butt Co., 82 Beekman, N. Y. ..40
Barnett Oscar, Newark N. J. 8
Cowles Hardware Co., Unionville, Ct. 10
Enterprise Mfg. Co., Phila. 34
Hart, Bliven & Mead Mfg. Co., 243 Pearl N. Y. 34
Ives, Woodruff & Co., Mount Carmel, Conn. 33
Middletown Tool Co., 18 & 20 Cliff, N. Y. 38
Miller's Falls Mfg. Co., 78 Beekman, N. Y. 25
Pratt & Co., Buffalo, N. Y. 31
Providence Tool Co., Providence, R. I. 19
Schweitzer Mfg. Co., 57 Reade, N. Y. 28
The Hull & Belden Co., Danbury, Conn. 7
Phelan Edward, 113 Chambers, N. Y. 26
Union Mfg. Co. 99 Chambers, N. Y. 7
Van Wagoner & Williams, 82 Beekman, N. Y. 40
Wilson Mfg. Co., 91 Chambers, N. Y. 39

Hardware Specialties.
American Mfg. Co., New Haven, Conn. 36
Byington & Northup Rochelle, Ills. 23
Erling P. R. & Co., Milwaukee, Wis. 18
Grant & Co., Newark, N. J. 8
Hardy & Co., 102 Elm, N. Y. 15
Langdon Mitre Box Co., Millers Falls, Mass. 25
Post C. C., Burington, Vt. 28
Shepard Sidney & Co., Buffalo, N. Y. 31
Washburn B. D. & Co., Boston, Mass. 15

Hose, *Maker of.*
Hicks O. B. & Co., Baltimore, Md. 34

Hog Ringers.
Blair E., Bucyrus, O. 10

Hoisting Engines, *Makers of.*
Crane Bros. Mfg. Co., Chicago, Ill. 9
Otis Bros. & Co. 348 Broadway, N. Y. 9

Horse Hay Forks and Fixtures, *Makers of.*
Nellis A. J. & Co., Pittsburgh, Pa. 40

Horse Nails, *Makers of.*
Ausable Horse Nail Co. 25 Chambers, N. Y. 34
Globe Nail Co., Boston, Mass. 34
Pratt & Co., Buffalo, N. Y. 31
Putnam S. S. & Co., Neponset, Mass. 9

Horse Shoes, *Makers of.*
Burden Iron Works, Troy, N. Y. 4
Rhode Island Horse Shoe Co., Providence, R. I. 7
Schoenberger & Co., Pittsburgh, Pa. 4
Semple, Birge & Co., St. Louis. 28

Hydraulic Jacks.
Dudgeon Richard, 24 Columbia, N. Y. 39

Ice Chisels.
Holden E. J. & Co., 54 Beekman, N. Y. 6

Insurance, Boiler.
Hartford Steam Boiler Inspection and Insurance Co. 39

Iron Brokers.
Boynton Geo. A., 70 Wall, N. Y. 4
Coleman & Bro., Louisville, Ky. 4
Crane U. O., 104 John, N. Y. 4
Hatrr A. G., Pittsburgh, Pa. 4
Hazard T. D. 204 Pearl, N. Y. 4
Smith W. Minor, 95 Beaver, N. Y. 4

Iron Bridges.
Leighton Bridge and Iron Works, Rochester, N. Y. ..15

Iron, Charcoal, *Warm or Cold Blast,*
Quincy John W., 98 William, N. Y. 4

Iron Commission Merchants.
Carpenter J. O., 104 John, N. Y. 4
Justice Cox Jr. & Co., 832 Walnut, Phila. 5
Hand Jas. U. & Co., 308 and 310 Market, Phila. 6
Maitn Bros. 228 Dock, Phila. 5
Spooner & Collins, St. Louis, Mo. 4

Iron Railing.
Vreeland D., 128 W. 38, N. Y. 4

Iron, Pig, *Importers of.*
Williamson James & Co., 69 Wall, N. Y. 4

Iron Pig, *Manufacturers of*
Parrott Peter P., Greenwood Fce., Orange co., N. Y. 4

Iron Dealers.
Abeel Brothers, 190 South, N. Y. 4
Bonnell, Botsford & Co., Youngstown, O. 4
Borden & Lovell, 70 and 71 West, N. Y. 4
Cleveland, Brown & Co., Cleveland, O. 4
Cooney Daniel F., 88 Washington, N. Y. 4
Huerstel G., 99 Market Slip, N. Y. 4
Fuller, Lord & Co., 189 Greenwich, N. Y. 4
Fuller, Dana & Fitz, 110 North, Boston 2
Wm. Gardner's Sons, 275 Grand, N. Y. 4
Harrison & Gilloon, 558 to 562 Water, N. Y. 4
Holden, Hopkins & Stokes, 104 Joon, N. Y. 4
Jackson & Chase, 206 and 208 Franklin, N. Y. 4
Judson B. F., 457 and 459 Water, N. Y. 4
Matthews Chas. W. 133 Walnut Phila. 5
Ogden Wallace, 55, 57, 59 and 91 Elm, N. Y. 4
Pierson & Co., 24 Broadway, N. Y. 4
Quincy John W., 98 William, N. Y. 4
Reed John H. & Co. 6
Richards D. W. & Co., 92 Mangin St., N. Y. 4
Snyder Ass. Richmond, Va. 4
Wallace Wm. H. & Co., Albany and Washington streets, N. Y. 4
Warner A. B. & Sons, 28 and 29 West, N. Y. 4
Williamson James & Co., 69 Wall, N. Y. 4
Whitney A. R. & Bro., 58 Hudson N. Y. 4

Iron, *Manufacturers of.*
Bradley, Reis & Co., 24 Cliff, N. Y. 4
Britannia Iron Works, Middlesbro', Eng. 4
Burden Iron Works, Troy, N. Y. 4
Cleveland Rolling Mill Co., Cleveland, O. 6
Coffin Wm. E. & Co., 8 Oliver, Boston 4
Boston Rolling Mills, 17 Batterymarch, Boston 4
Everson, Macrum & Co., Pittsburgh, Pa. 4
J. & J. Rogers Iron Co., Ausable Forks, N. Y. 8
Lackawanna Iron and Coal Co., Scranton, Pa. 5
Leonard John, 450 & 451 West st. N. Y. 4
Milwaukee Iron Co., Milwaukee, Wis. 6
Old Dominion Iron & Nail Works Co., Richmond, Va. 5
Oxford Iron Co., 81 Washington, N. Y. 4
Phœnix Iron Co., 410 Walnut, Phila. 5
Rowland Wm. & Harvey, Phila. 40
Shoenberger & Co., Pittsburgh, Pa. 4

Iron, Pianished Sheet *Manufacturers of*
Wood W. D. & Co., Pittsburgh, Pa. 5

Iron, Swedish, *Importers of.*
Fuller, Dana & Fitz, Boston, Mass. 2
Jessop Wm. & Sons, 91 and 93 John, N. Y. 32
Mitander Nils, 69 William, N. Y. 4

Japanned Tin Ware.
Jewett John C. & Sons, Buffalo, N. Y. 4

Keys and Cotters. *Manufacturers of.*
Barnes Geo. & Co., Syracuse, N. Y. 26

Lanterns. *Manufacturers of.*
Dietz R. E., (Tubular) 54 and 56 Fulton, N. Y. 40
Howard & Morse 45 Fulton, N. Y. 2

Lead Pipe, &c., *Manufacturers of.*
Bayley, Farrell & Co., Pittsburgh, Pa. 2

Locks. *Manufacturers of*
American Lock Mfg. Co., Cazenovia, N. Y. 13
Bonannan Wilson, Broadway and Kosuth, Brooklyn, E. D. 18
D. K. Miller Lock Co., 132 Cherry, Philadelphia.
Romer & Co., Newark, N. J. 9
Union Nut Co., 78 Beekman, N. Y. 15
Yale Lock Mfg. Co., 298 Broadway, N. Y. 35

Lubricators. (Patent) *Maker of.*
Crossley H., Brooklyn, N. Y. 38

Machinery, *Makers of.*
Hendey Machine Co., Wolcottsville, Ct. 28
Pratt & Whitney Co., Hartford, Conn. 38
Sellers Wm. & Co., 1600 Hamilton Phila. 39
The Hull & Belden Co., Danbury, Conn. 7
Walker Joseph, 915 Market Phila., Pa. 38
Wetherill Robert & Co., Chester, Pa. 28
Wood Thomas 2106 Wood, Phila. 39

Machine Screws, *Makers of.*
Boone W. C., 38 Humbo'dt, Brooklyn, E. D. 12
Ducreux C., 93 Elizabeth, N. Y. 12
Lyon & Fellows Mfg. Co., Williamsburg, N. Y. 12
Reynolds & Co., New Haven, Conn. 4

Machinists' Tools, *Makers of.*
Blaisdell P. & Co., Worcester Mass. 38
Harrington Edwin & Son, 15th st. and Pa. ave., Phila. 19
Jones, Lamson & Co., Windsor, Vt. 38
Le Count C. W., South Norwalk, Conn. 39
Raiser Louis, 125 Worth, N. Y. 25
Van Baagen C. & Co., Phila., Pa. 26
Wiley & Russell Mfg. Co., Greenfield, Mass. 40

Malleable Articles. *Maker of.*
Hammer & Co., Branford, Ct. 19

Measuring Tapes.
Eddy Geo. M. & Co., 353 Classon Ave., Brooklyn, N. Y. 32

Mein Dealers and Brokers.
Coddington T. B. & Co., 25 and 27 Cliff, N. Y. 2
Crane C. O., 104 John, N. Y. 4
Fuller, Dana & Fitz, Boston, Mass. 2
Gregg H. L. Co., 108 Walnut, Phila. 5
Lefferts J. C., 241 Pearl, N. Y. 4
W. J. Hammond, Pittsburgh, Pa. 2
Phelps, Dodge & Co., Cliff, bet. John & Fulton, N. Y. 2
Purves A. & Son, cor. South and Penn, Phila. 20
Quincy J. W., 98 William, N. Y. 4
Sturges Frank & Co., 72, 74 & 76 Lake, Chicago. 2
Thomson A. A. & Co., 213 Water, N. Y. 2
Van Wart & McCoy, 134 and 136 Duane N. Y. 2

Metallurgists.
Britton J. Blodgett 339 Walnut, Phila. 6
Hart Edward, Easton, Pa. 6
Wallace & Humphrey, 113 Walnut, Phila. 6

Metal Roofing.
Hickcox Mfg. Co., 230 Pearl N. Y. 4

Metal Oil Cloth Binding.
Eaton Geo. S., First st., cor. N. 3d st., Brooklyn, E. D., N. Y. 32

Meat Chopping Machinery.
Murray Iron Works, Burlington, Iowa 13

Miners' Candles. *Makers of*
James Boyd's Sons, 10 and 12 Franklin, N. Y. 25

Mining Spikes
Roseberry Geo. D., Pottsville, Pa. 4

Molders' Tools.
Carter H. 220 Pearl, N. Y. 10

Molding Machines, *Makers of*
Hammer T. F., Branford, Conn. 26

Mouse Traps, Catchemalive, *Makers of.*
Dietz R. E., 54 and 56 Fulton, N. Y. 40

Nails.
Schoenberger & Co., Pittsburgh, Pa. 4

Nail Pullers.
Maltby, Curtiss & Co., 34 Reade, N. Y. 14

Nickel Platers.
Colt A. T., 47 Beekman, N. Y. 27
Continental Nickel Plating Works, 47 Ann, N. Y. ..27
Hartman John, 3734 N. Seventh, Philadelphia 2
Manhattan Nickel Works, 180 and 182 Center, N. Y. 27
New York Nickel Plating Co., 133 West 25th, N. Y. ..27
Owen S. S. & Co., 131 E. 13, N. Y. 27
Roehrig, Fred Wm., 417 Center, N. Y. 27
Wicks & Co., 79 First st., Brooklyn, E. D., N. Y. ..27
Wilder & Co., 114 Fulton, N. Y. 27

Norway Shapes. *Rollers of.*
Rowland Wm. & Harvey, Frankford, Phila. 40

Note Broker.
Gallaudet F. W 3 and 5 Wall, N. Y. 4

Nuts, Bolts, etc., *Makers of.*
American Bolt Co., 210 Lawrence, Lowell, Mass. 13
Clark Bros. & Co., Middale, Conn. 12
Ely & Co. 113 Chambers, N. Y. 4
Fuller, Lord & Co., 189 Greenwich, N. Y. 4
Haskell W. H. & Co., Pawtucket, R. I. 13
Hoopes & Townsend, 1330 Buttonwood, Phila. 12
Lewis, Oliver & Phillips, Pittsburgh, Pa. 13
New Haven Nut Co., Westville, Ct. 6
Roseberry Geo. D., Pottsville, Pa. 4
Russell, Birdsall & Ward, Port Chester, N. Y. 40
Shelton Co., Birmingham, Conn. 34
Sternbergen J. H., Reading, Pa. 13
Union Nut Co., 78 Beekman N. Y. 6

Oil Lubricating, *Makers of*
Lester Oil Co., 153 Water, N. Y. 37

Oil Stones, *Makers of.*
Boyd & Chase, 107th street and 1st avenue, N. Y. ..37

Old Iron, etc.
Greer H. L. & Co., 108 Walnut, Philadelphia 5

Ore Crushers.
Blake Crusher Co., New Haven Ct. 36

Paints and Oils. *Dealers in.*
Devoe F. W. & Co., 117 Fulton, N. Y.

Patent Solicitors.
A. V. Briesen, 236 Broadway, N. Y. 20
Burke & Fraser, 37 Park Row, N. Y. 28
Cox & Cox, 229 Broadway, N. Y. 28
Howson & Son, Phila. and Washington, D. C. 28
Lehmann F. A. Washington, D. C. 28
Munn & Co., *Scientific American* 37 Park Row N. Y. 36
Nye Francis C., 93 Murray, N. Y. 28
Simonds W. E., Hartford, Ct. 28
Spencer A. H., 28 State Boston, Mass. 28
Stetson T. D., 23 Murray, N. Y. 25

Picture Nails, etc., *Manufacturers of.*
Richards T. C. & Co., 47 Murray, N. Y. 2

Pipes, Fittings, etc., *Makers of.*
Eaton, Cole & Burnham Co., 58 John, N. Y. 26
Meyer Henry C. & Co., 48 Cliff, N. Y. 40
McNab & Harlin Mfg. Co., 56 John, N. Y. 26
Pancoast & Maule, 227 Pear, Phila. 26

Pipe, Water and Gas, *Makers of.*
Barr Edward, 78 John, N. Y. 26
Leighton Bridge and Iron Works, Rochester, N. Y. 15
McNeal John & Sons, Burlington, N. J. 6
National Tube Works Co., 78 William, N. Y. 26
Warren Foundry & Mach. Co., Phillipsburg, N. J. ..26
Wood R. D. & Co., 400 Cheanut, Phila. 26

Plane Irons, *Manufacturer of*
Buck Bros., Millbury, Mass. 3
Mack & Co., Rochester, N. Y. 25
Middletown Tool Co., 18 & 20 Cliff, N. Y. 6

Planes, *Manufacturers of.*
Greenfield Tool Co., Greenfield, Mass. 10
Mack & Co., Rochester, N. Y. 25
Stanley Rule & Level Co., 85 Chambers, N. Y. 25

Plated Ware
Derby Silver Co., Derby, Ct. 40
Hall, Elton & Co., 75 Chambers, N. Y. 10
Rogers & Bros., 203 Broadway, N. Y.
Reed & Barton 2 Maiden Lane, N. Y. 33

Plows, Chilled Iron. *Makers of.*
South Bend Iron Works, South Bend, Ind. 13

Plumbago Lubricator.
Joseph Dixon Crucible Co., Jersey City, N. J. 40

Plumbers' Materials, *Manufacturers of*
Baltimore Bell and Brass Works, 53 and 55 Holliday, Baltimore, Md. 12
Everhart Jas. M., Scranton, Pa. 40
Redfield, Bowen & Walworth Co., Chicago, Ill. 40
Carr Wm. S. & Co. 106 Centre, N. Y. 26

Presses, Power, *Makers of.*
Boomer & Boschert Press Co., Syracuse, N. Y. and 26 Beekman, N. Y. 28
Merriman A. H., West Meriden, Ct. 34
The Stiles & Parker Press Co., Middletown, Ct. 36
Peck Milo, New Haven, Conn. 38

Pressure Blowers. *Makers of.*
Wild R. W., 20 Cortlandt, N. Y. 33

Printing Presses.
Kelsey & Co., Meriden, Conn. 40

Pumps, *Makers of.*
Clayton Jas., 11 Water, Brooklyn, N. Y. 9
Douglas W. & B., Middletown Conn. 7
Rumsey & Co., Seneca Falls, N. Y. 7
Union Mfg. Co., 99 Chambers, N. Y. 7

Pyrometers.
Brown Edward, 311 Walnut, Phila.

Railroad and Mining Tools.
Metcalf, Paul & Co., Pittsburgh, Pa. 37

Railroad Supplies.
Duyckinck W. C., 50 and 52 John, N. Y. 8
Jackson & Tyler Baltimore, Md. 37
Rogers H. A., 19 John, N. Y. 25

Rails, Iron or Steel, *Makers of.*
Atkins Bros., Pottsville, Pa. 6
Cambria Iron Co., Johnstown, Pa. 5
Cleveland Rolling Mill Co., Cleveland, O. 6
Griswold John A. & Co., Troy, N. Y. 33
Lackawanna Iron and Coal Co., Scranton, Pa. 5
Milwaukee Iron Co., Milwaukee, Wis. 6

Razor Straps, *Makers of.*
S. F. Badger & Son Charlestown, Mass. 26

Refrigerators.
Jewett John C. & Sons, Buffalo, N. Y.

Rivets.
Timme's Son Peter, 281 North 6th, Brooklyn, E. D. .. 4

Road Scrapers, &c., *Makers of.*
Revolving Scraper Co., Columbus, O.

Rolling Mill Machinery, etc., *Manufacturers of.*
Moore James, Cor 16th and Buttonwood, Phila. 36

Rules. *Manufacturers of.*
Stanley Rule and Level Co., 85 Chambers St. 25
Stephens & Co., Riverton, Ct. 25

Saddlery Hardware, *Makers of*
Sargeant Mfg. Co., Newark, N. J. 12

Sad Irons. *Makers of*
Brooklyn Sad Iron Co., Brooklyn, E. D., N. Y. 33

Safe Deposit Co.
Penna. Warehousing & Safe Deposit Co., Front and Lombard, Philadelphia. 26

Sand and Emery Paper. *Makers of*
Reader, Adamson & Co

Established 1845.

WOODBRIDGE, N. J.

Fire Brick Works.

WM. H. BERRY & CO.

Manufacturers of all forms and sizes of **FIRE BRICK**, for Blast Furnaces, Rolling Mills, Gas House and Oven Tiles, and Stove Linings, made to order. Also, Fire Clay, Kaolin, Sand and Fire Mortar.

Brick Presses,

BRICK PRESSES,

For Fire and Red Brick,

PATENT STEAM GEARING

For grinding Clay for Red or Fire Brick, and all kinds of **Brick Machines** in general.

Works, 1819 Germantown Ave., Phila.

GEO. CARNELL.

Oldest and Largest Establishment of the kind in the U. S

F. L. & D. R. CARNELL,

1844 Germantown Avenue, Philadelphia

Manufacturers of Pennsylvania Brick Machine Little Giant Pipe Machine, Fire and Red Brick Presses, Clay Wheels, Tile Machines, Stampers, Grinding Pans. Brick Yards fitted out for running by steam or horse. Heavy and Light Castings. Send for circular.

PERSEVERANCE

Iron Works & Machine Shop.

MARCUS SCHANTZ,

Having established himself in the Iron and Machine Business in **Water St., Perth Amboy**, is now prepared to execute all orders in machinery, such as **STEAM ENGINES, BRICK MACHINES, BRICK-PRESSES AND TILING MACHINERY.** Also, Steam Fitting, and Iron and Brass Castings, &c., furnished in the shortest time, and in the best and most workmanlike manner.

MANILA

Water Pails.

These goods we *Warrant* not to be affected by climate, or **WATER, HOT or COLD.**

Are Durable, Light, Strong and Tasteless, **HAVE NO HOOPS,** and will not absorb their contents. Orders from the trade solicited.

For samples or circulars, address,

W. F. HYATT,

Manufacturers' Agent,

54 BEEKMAN ST., - - NEW YORK.

LOUIS RAISER,

Successor to GEORGE REUTHER,

Machinist, Model and Lathe Maker.

125 & 127 Worth Street, NEW YORK.

Bet. Centre & Elm Sts. (Saw Mill).

Residence, 214 Canal St.

SCHWEITZER MFG. CO.,

57 Reade Street, New York.

Manufacturers, importers and dealers in foreign and American Iron, Hardware, Cutlery, &c. Also manufacturers' agents for Files and Tools, Solid Cast Steel Hammers and Sledges of all kinds, Rules, Plows, Gauges, Plumbs and Levels, Boring Machines, Horse Brushes, &c.

JANUARY, 1876. J. A. SAXTON, Manager.

The Sugar Maker's Friend,

PRICE, $4.50 per hundred.

More agents wanted to canvass for the sale of **Post's Patent Galvanized Metallic Eureka Sap Spout and Bucket Hanger.** Samples, Circulars and Terms sent on receipt of 20cts to pay postage. Address,

C. C. Post, Manufacturer & Patentee Burlington, Vt.

STEEL STAMPS.

LETTERS, FIGURES, &c.,

Of every description and for all purposes.

Best Work. Lowest Prices.

RICHARD H. ROGERS.

45 Ann Street, (Rear), - - New York.

Orders by mail promptly attended to.

NAME PUNCHES.

Send 50 cents for 6 samples (Prepaid) of

HAMMOND'S WINDOW SPRINGS,

For supporting and locking upper and lower sashes of all windows. Not a coiled spring, but one *forged* from best materials. **W. S. HAMMOND, Lewisberry, York Co., Pa.**

BOOMER & BOSCHERT, POWER PRESSES for **CIDER, CLOTH, COTTON, LARD, Leather, PAPER, Parafine, &c**

Compressing Substances or Expressing Fluids

Address B. & B. Press Co. Syracuse, N.Y. or 26 Beekman St. New York City.

PENNA. WAREHOUSING AND SAFE DEPOSIT CO.

WAREHOUSES:

FRONT AND LOMBARD STREETS.

IRON STORAGE YARDS:

Port Richmond, Philada; Reading, Pa Allentown, Pa

NEGOTIABLE RECEIPTS ISSUED

OFFICE OF THE CO.

N. W. cor. Third & Chestnut Sts

OFFICERS:

THOS. T. JEWETT, President. | B. K. JAMISON, Vice-President.

JAMES P. SCOTT, Secretary and Treasurer. | J. M. COLLINWOOD, Gen'l Sup't

DIRECTORS:

Henry Pemberton, Henry P. Sloan, P. C. Hollis, | Geo. W. Woodward, J. H. Catherwood, D. A. Dangler, J. T. Auden ried.

MINERS' CANDLES.

uperior to any other Light for Mining Purposes. Manufactured by

JAMES BOYD'S SON,

Nos. 10 & 12 Franklin St., N. Y.

B. KREISCHER & SON.,

New York Fire Brick & STATEN ISLAND CLAY RETORT WORKS,

Established 1845.

Office, 58 Goerck Street, cor. Delancy Street,

East River, New York.

The largest stock of Fire Brick of all shapes and sizes on hand, and made to order at short notice.

Cupola Brick, for McKenzie Patent, and others. Fire Mortar, Ground Brick, Clay and Sand. Superior Kaolin for Rolling Mills and Foundries. Stone Ware and other Fire Clay and Sand, from my own mines at New Jersey and Staten Island by the cargo or otherwise.

NEWTON & CO.,

Successors to

PALMER, NEWTON & CO.,

ALBANY, N. Y., Manufacturers of

FIRE BRICK

Stove Linings,

Range and Heater Linings

Cylinder Brick, &c., &c,

Philadelphia Fire Brick AND Clay Retort Works,

AND KENSINGTON FIRE BRICK WORKS

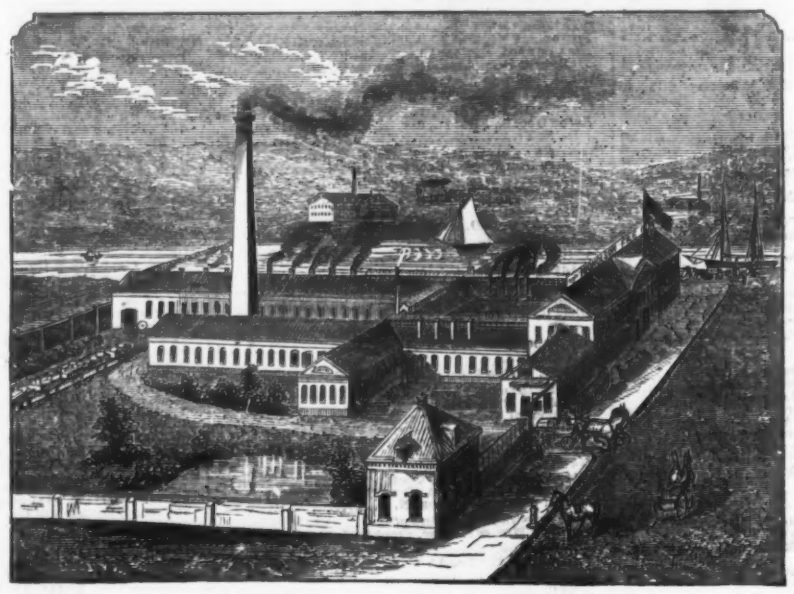
Office, 23d and Vine, Philadelphia.

PHILIP NEWKUMET,

Successors to **JOHN NEWKUMET, Proprietor,** manufactures 9-inch Fire Bricks, Tiles, and Blocks for Rolling Mills, Blast Furnaces, Foundries Gas Works, Lime Kilns, Glass Houses, &c., &c

Articles of every description made to order short notice, and in a very superior manner.

"CLAY RETORTS FOR SUGAR HOUSES."



DEALERS AND CONSUMERS

OF FILES

SHOULD PURCHASE THE

Nicholson or "Increment Cut" File

FOR THE FOLLOWING REASONS:

First.—They are made from the best quality of File Steel.

Second.—Each File undergoes a careful inspection after each operation, by critical inspectors, and none but perfect work allowed to pass.

Third.—They are cut by the **"Increment" or irregular cut,** therefore combine the advantages of both Hand and Machine work.

Fourth.—They **will finish finer** than Files of any other make of same degree of coarseness.

Fifth.—They **will not "pin"** or scratch like hand-cut Files.

Sixth.—The **"Increment cut"** File, by our records, **will remove more stock with a given number of pounds applied** than any other File with which we are acquainted

Seventh.—All Files under seven inches are **put up in boxes** of one dozen each, and neatly labeled.

Eighth.—The large stock carried by us, combined with our superior facilities, enables us to fill the largest orders at the shortest possible notice.

Ninth.—We are constantly making careful tests of our Files by delicately constructed machinery, which **automatically records** the **actual power applied,** forward, backward and downward, at each stroke of the File, also the number of strokes, combined with the work performed, enables us not only to judge of the **quality of our Steel for wear,** but **also of the cutting qualities** of the File, and the ease (expressed in pounds) with which a given amount of work can be accomplished.

Finally.—Our Files **are warranted** to be **hard, well cut** and **sound.** They are exclusively used by many of the largest Railroads and Machinists in the country—and the vigorous growth of our reputation, not only for making a good article, but of **our ability to furnish a good article cheap,** is evidenced by the large number of Dealers and Jobbers who are handling our Files exclusively.

NICHOLSON FILE COMPANY, Providence, R. I.

SOLD BY HARDWARE DEALERS GENERALLY.

CROOKE & CO.,

MANUFACTURERS OF

WROUGHT IRON BUTTS,

All our goods are manufactured from patent faced iron plates; they have a smooth face and bright finish.

163 & 165 Mulberry Street, New York.

FERNALD & SISE, Agents, 100 Chambers Street, N. Y.

Burke & Fraser,

SOLICITORS OF

PATENTS

37 PARK ROW, N. Y. CITY.

Established 1851. *Also Consulting Engineers.*

PATENTS. Thomas D. Stetson, No. 37 Murray St., N. Y. Solicitor of Patents, and Scientific Expert in patent cases.

Send for circular.

Watson Fire Brick Manufactory

ESTABLISHED 1836.

JOHN R. WATSON, Perth Amboy, New Jersey.

Manufacturer of

FIRE BRICK,

For Rolling Mills, Blast Furnaces, Foundries, Gas Works, Lime Kilns Tanneries, Boiler and Grate Setting, Glass Works, &c.

FIRE CLAYS, FIRE SAND, AND KAOLIN FOR SALE.

A. HALL & SONS, Perth Amboy, N. J.

ESTABLISHED 1846.

HALL & SONS, Buffalo, N. Y.

ESTABLISHED 1866.

FIRE BRICK

of reliable quality for all purposes, manufactured of the best New Jersey Fire Clays. Also, ROCKINGHAM WARE, YELLOW WARE, Fire Clay, Fire Sand, Kaolin Ground Fire Brick, and Diamantine Building Brick.

HENRY MAURER,

Late of the firm of MAURER & WEBER,

Proprietor of the

Excelsior Fire Brick & Clay Retort Works,

Sole Manufacturer of **French Pat. Roofing Tiles and Hollow Brick.**

WORKS: PERTH AMBOY, NEW JERSEY.

Office & Depot: **418 to 422 East 23d St.,** bet. 1st Ave. and Ave. A, **New York.**

BROOKLYN CLAY RETORT AND Fire-Brick Works,

Van Dyke Street, Brooklyn, N. Y.

E. D. White Surviving Partner of the late firm of **J. K. Brick & Co.**

Manhattan Fire Brick & Enameled Clay Retort Works,

ADAM WEBER, - - Proprietor.

Office, **633 E. 15th St., N. Y.** Clay Retorts, Enameled for Gas Houses; Retorts for burning raw bone and re-burning bone for Bone Black. Fire Bricks, Tiles, Blocks, Cupola and Range Bricks of all shapes and sizes. The best fire clay from my own Clay Beds at Perth Amboy, N. J.

M. D. Valentine & Bro

Manufacturers of

FIRE BRICK And Furnace Blocks.

IN ALL ITS BRANCHES.

Woodbridge, - - - N. J.

National Fire Brick & Drain Pipe W'ks,

CHAS. ANNESS & SONS, Props.,

Manufacturers of **FIRE BRICK** all shapes and sizes.

Miners and Shippers of all kinds of **FIRE CLAY.**

Factory at SPA SPRINGS, on Perth Amboy and Woodbridge, R. R.

Post Office address, ***Woodbridge, N. J.***

TROY STOVE LINING AND Fire-Brick Works.

BELL & BACON.

Stove Linings a Specialty. **TROY, N. Y.**

JAS. C. BELL, JR. J. BLUNT BACON.

COX & COX,

Counsellors at Law,

229 Broadway, NEW YORK.

Practice in cases relating to

PATENTS and TRADE MARKS.

Before the

Courts and Patent Office.

A. H. SPENCER,

Solicitor of Patents,

And Expert in Patent Cases.

28 State St., Room 19, Boston.

HOWSONS'

OFFICES FOR PROCURING

UNITED STATES AND FOREIGN PATENTS,

Forrest Buildings

119 SOUTH FOURTH ST., PHILADELPHIA,

AND MARBLE BUILDINGS

605 Seventh St. (Opposite U. S. Patent Office, ***Washington, D. C.***

H. HOWSON, Solicitor of Patents. | C. HOWSON, Attorney at Law.

Communications should be addressed to the PRINCIPAL OFFICES, PHILADELPHIA.

PATENTS.

F. A. LEHMANN,

Solicitor of American & Foreign Patents.

WASHINGTON, D. C.

No Patents, No Pay. Send for Circular.

FRANCIS C. NYE,

Counsellor at Law,

13 Murray St., N. Y.

PATENT CASES

brought or defended in any district of the U. S.

SOLICITS W. E. SIMONDS, Atty & Sol (Patent) Law. **PATENTS**

In the U. S. and abroad, with special aim to strength and validity, and in shortest possible time. Pamphlet free. 345 Main St., Hartford, Conn.

Keystone Saw, Tool, Steel & File Works.

HENRY DISSTON & SONS,

Front and Laurel Sts., Philadelphia.

NEW TOOLS.

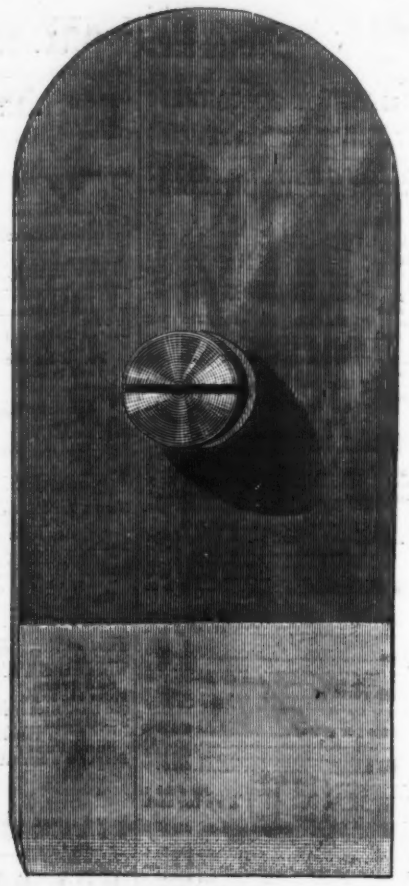


Fig. 3.

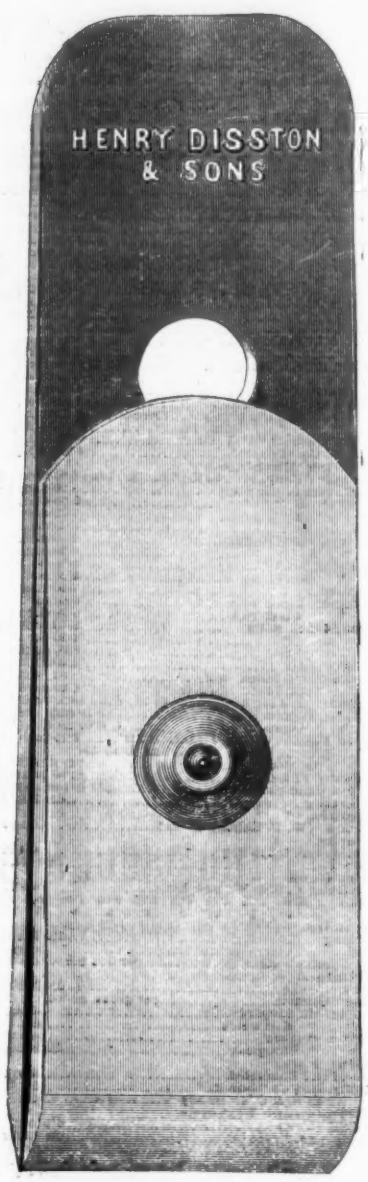


Fig. 3.

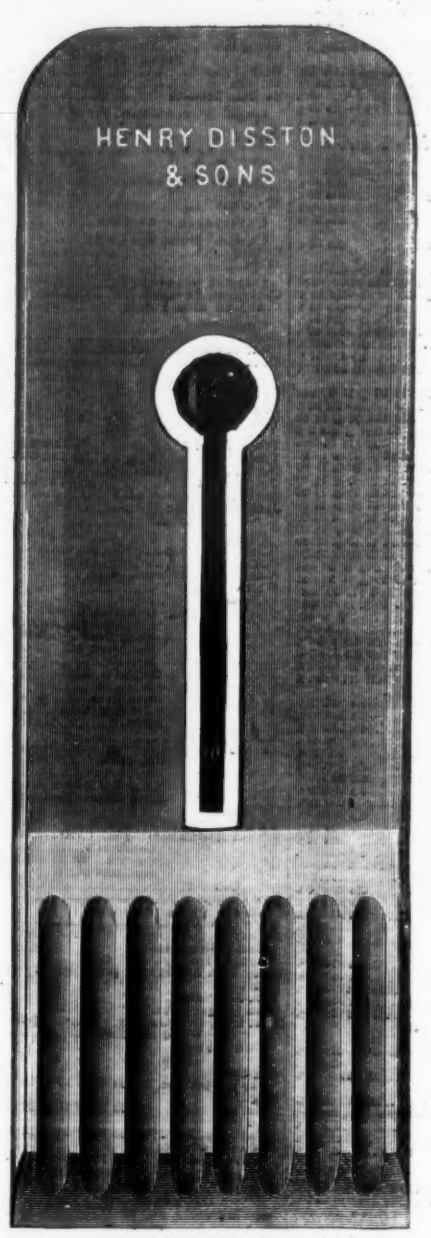


Fig. 3.

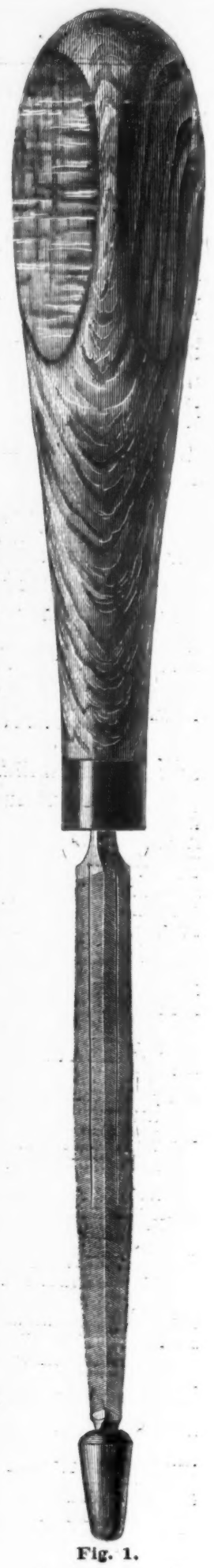


Fig. 1.

Fig. 6.

Fig. 7.

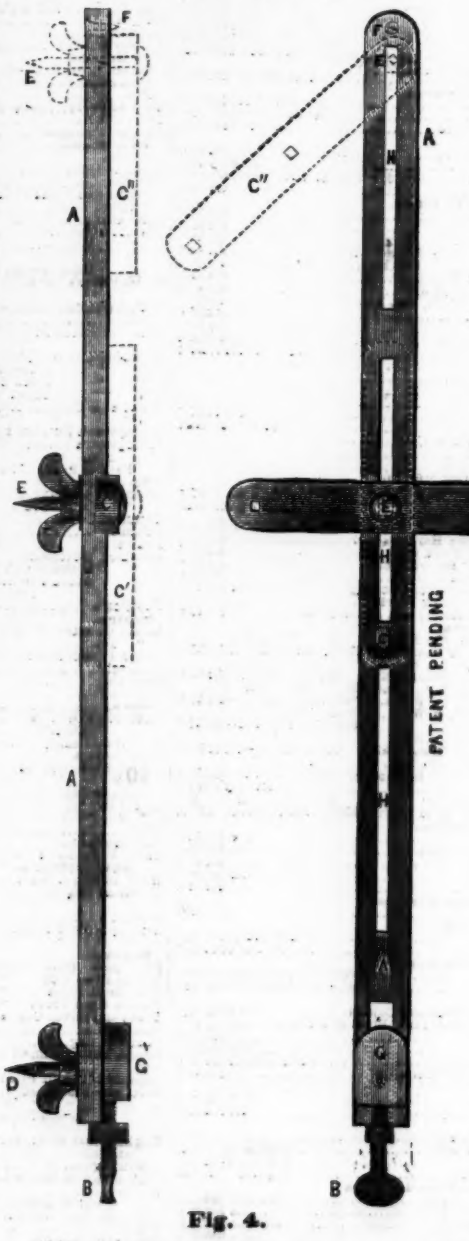


Fig. 2.

Fig. 4.

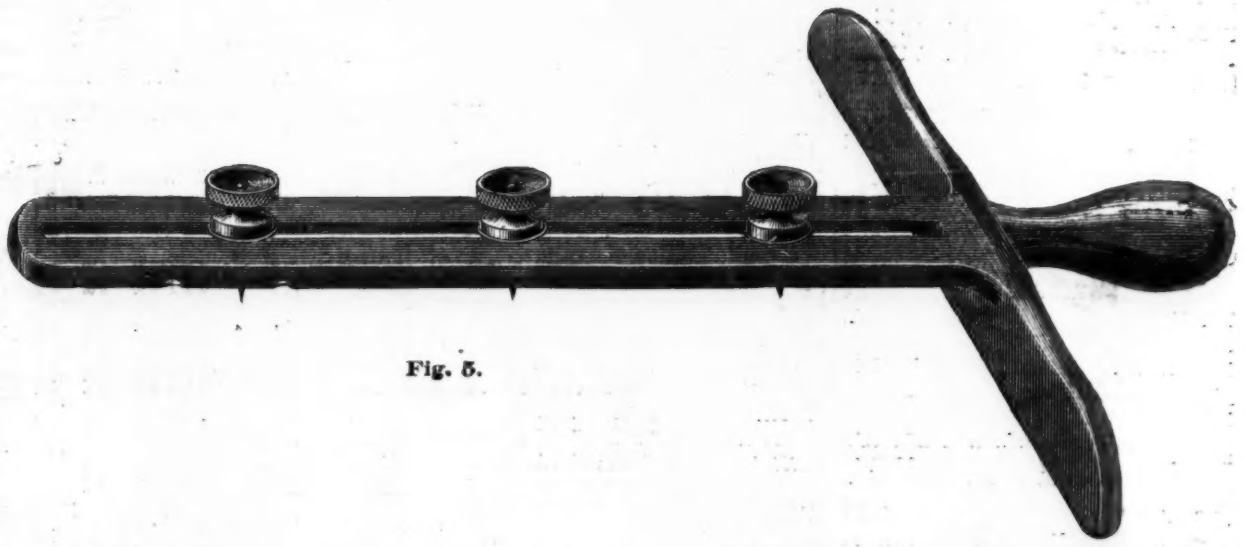


Fig. 5.

An article descriptive of these Tools will be found on the 20th page, to which we invite the attention of the trade.

New York Wholesale Prices, February 9, 1876.

HARDWARE.

Anvils.
Wright's.....₩ ℔ gold 10¼c; over 250 ℔s 11c, gold
Armitage's Mouse Hole.....gold 11c
Wilkinson's.....₩ ℔ gold 11c
Eagle Anvils (American).....₩ ℔ 10c dis 30 %

Apple Parers.
Domestic.....
Turn Table.....
Lightning.....
Hudson's.....
Reading.....
Union.....
Skeleton Paring, Coring and Slicing.....$8 00 ₩ doz net
Bay State, Paring, Coring and Slicing.....$15 00 dis 10 %
Climax Slicer.....8 00

Ash Sifters.
J. E. Corning's Barrel Head.....dis 10 %
Rival.....₩ doz $12·00 net
Square.....per doz $2·50 dis 20 %

Augers and Bits.
Conn. Valley Mfg. Co.....
Douglass.....
Ives.....
Beecher, French, Swift & Co).....
Griswold.....
Challenge.....
1st quality.....dis 40&10 %
Nobles Mfg. Co.....dis 40 & 10 %
Cook's.....d's 40&10 %
Diamond Hardware Co.....dis 25&10&10 %
Snell Mfg. Co.....dis 25 %
Jennings' Bits.....dis 10 %
Lewis' Single Twist Bits.....dis 25 %
Andrews' Bits.....dis 25 %
Griswold's Patent Bits.....dis 30 %
Expansive Bits, Clark's....small, $18; large, $26—dis 15 %
" " Ives'.....$30 @ $60—dis 30 %
" " Blake's.....$30—dis 40 %
Hollow Augers, Douglass'.....
" " Ives'.....
" " French, Swift & Co.....
" " Bonney's Adjust..₩ doz $48—dis 25&10 %
" " Stearns'.....₩ doz $48—dis 25&10 %
" " Ives' Expansive.....each $4·50—dis 40 %
" " Universal Expansive.each $4·50—dis 10 %
Gimlet Bits—Screw, $7·50; no screw, $6.....dis 30&10 %
Double Cut Gimlet Bits, Shepardson's.....dis 30 %
" " Ct. Valley Mfg. Co..dis 30&10 %
" " Hartwell's.....dis 50 %
" " Douglass'.....dis 25&10 %
" " Ives'.....dis 30 %
Morse's Bit Stock Drills, List of Jan'y 1, '75.....dis 25 %
L'Hommedieu's Ship Augers.....dis 20 %
Watrous Ship Augers.....dis 30 %
Vaughan's Post Hole—
6 in. $28 00; 7, 8 and 9 in. $25 per doz.....dis 20 %

Awls, Brad Sets, &c.
Awls, Sewing, Common.....per gross $1·20—dis 15 %
" " Best.....per gross $1·60—net
" Shouldered Peg.....per gross $2·25—dis 15 %
" Patent Peg.....per gross $2·40—dis 15 %
" Shouldered Brad.....per gross $2·25—dis 15 %
Brad Sets, Aikeu's.....per doz $12·50—dis 40 %
" No. 42, $10·50; No. 43, $12·50.....dis 45&10 %
" Clark's.....dis 40&10 %
" Stanley's Excelsior.....$12 50—dis 30&10 %

Axes.
Brooks'.....per doz $12 00 @ 14 00 net
Boodd's.....per doz $15 00 @ 18 00—dis 30 %
Hunt's.....₩ doz $12 50 @ 14 00
Collins'.....₩ doz 11 00 @ 15 50 net @ dis 5 %
H. Clark's (J. C. W. & Co.) bron'd or red.₩ doz $10 00 net
Hurd's.....₩ doz 10 00 @ 12 00
Simmons'.....₩ doz 11 00 @ 11 50
Morris'.....₩ doz 12 50 @ 13 50
Red Jacket.....₩ doz 12 00 @ 12 50
Mann's.....₩ doz 11 50 @ 13 00
" Double Bitted.....₩ doz 31 50 @ 32 00
Underhill's.....₩ doz 12 00 @ 13 00
" Crown.....₩ doz 12 50 @ 13 50
John Leverett's.....₩ doz 12 50 @ 15 50
Ten Eyck.....₩ doz $10 00 @ 12 50 net
M. H. Jones & Co.....₩ doz 10 50 @ 11 50 net
Nobles Mfg. Co.....per doz $10 50, net
Elephant.....per doz $10 50 @ 11 50 net
Axle Grease.—Frazer's.....₩ ℔ 6c.
Balances.
Bands.—Plated.....new list dis 50&5 %
Iron Rim.....new list dis 25&5 %
Bass (Plated list).....new list dis 50, 10&5 %
Orcide.....new list dis 50&5 %

Bells.
Hand, Light Brass.....dis 70&10 %
" Extra Heavy.....dis 60&10 %
" White Metal.....dis 50&10 %
" Silver Chime.....dis 30&10 %
" Swiss.....dis 25 %
" Globe (Cone's Patent).....dis 20&10 %
Gong, Abbe's.....dis 20&10 %
" Yankee.....dis 35&10 %
" Barton's.....dis 35 %
Crank, Taylor's.....dis 35&10 %
" Brook's.....dis 50 %
" Cone's.....dis 10 %
" Conger's.....dis 30&10 %
Lever, Sargent's.....dis 60&10&10 %
" Taylor's Bronze or Plated Lever.....net
" " Japanned Lever.....dis 25&10 %
" Hart, Bliven & Mead Mfg. Co.....dis 50&10 %
Bull, " " " " .....dis 50&10 %
" Brook's.....dis 50 %
" Western.....dis 25 %
Call.....
Cow—Common Wrought.....dis 20&10 %
" Western.....dis 20&10 %
" " Sargent's.....dis 50&10&10 %
" Kentucky "Star".....dis 20&10 %
" " Sargent's.....dis 50&10&10 %
" Dodge's Genuine Kentucky, new list—
Nos. 0 " 1 1½ 2 3 4 5 6 Hog.
$12·00 10·00 9·00 8·00 6·00 5·00 3·50 2·50 5·00—dis 45 %
" Yaw's Genuine.....dis 35 %
" Texas.....dis 35 @ 40 %

Bellows.
Blacksmiths', Common, List of Sept. 15.....dis 15 @ 20 %
" Extra and Pittsburgh Pattern.....List net
Moulders'.....dis 20 %
Hand Bellows.....dis 10 %

Blind Adjusters.—Domestic.....₩ doz $2—dis 20 %
Blind Fasteners.
Meckrell's.....dis 20 %
Van Sands, No. 000, $14·00; No. 00, $10·50 net @ dis 5 %
Washburn's Patent.....₩ gross $14·00 dis 5 %
Merriman's.....new list net
Blind Staples.
Boardman's Patent, ½ in. and larger.....₩ ℔ 37 c
⅜ in....." 42 c

"Block."
Differential Pulley Blocks.....dis 25 %
Tackle, Rope and Iron Strapped, Providence Tool Co.'s list.....dis 30 %
Burr's.....dis 10 %
Stanley Rule and Level Co.....dis 25&10 %

Bolts.
Cast Iron Barrel, Shutter, &c.....dis 60&10 %
Cast Iron Chain.....dis 60&10&10 %
Wrought Iron Barrel.....dis 50, 10&10 %
" " Square.....dis 50, 10&10 %
" " Shutter.....dis 60&10 %
Wrought Iron Plumb, Stanley's.....dis 15&10 %
" " Sargent's.....dis 50&10&10 %
Carriage and Tire, Common.....dis 25 %
" " Norway Iron.....dis 50 x 10 %
" " B. B. & W.....(old list) dis 65 %
" " Philadelphia.....dis 60&5 %
" " Shelton's.....(old list) dis 60&10 %
Union Nut Company, old list.....dis 65&5 %
Screw.....dis 30 %
" R. B. & W.....dis 25 %
" Shelton's Shaved Head.....dis 25 %

Borax.
Boring Machines.

	Upright.	Angular.
Hoyer's, no Augers	$3·15	$4·00 net
" with Augers	5·00	6·00 net
Douglass', no Augers	5·50	7·50 dis 40 %
" with Augers	9·00	11·00 dis 40 %
Parr's, no Augers	5·00	7·50 dis 30 %
" with Augers	7·50	10·00 dis 30 %
Kellogg's, no Augers	5·25	6·75 dis 15 %
Sweets' "	5·25	4·00 net
" with Augers	5·00	6·00 net
Snell's, "	4·75	6·25 dis 20 %
Phillips', with Augers		16·00 dis 25 %
Mortising Machines, $30·00 each		dis 20 %

Bow Pins.
Union Nut Co.....new list dis 50&10&5 %
Cockshaw's.....dis 50 @ 55 %
Hunnason, Beckley & Co's.....dis 50&10&5 %
Sargent & Co.'s.....dis 50&10&10 %

Braces.
Barber's Patent.....dis 40&5 %
C. S. Backus.....dis 40&10 %
Wilcox Mfg. Co.....dis 10 %
Spofford's Patent.....dis 50 %
Noble's Patent.....dis 40&5 %
Ives' Novelty.....dis 40&7½&10 %
" Hamden.....dis 15&10 %
Common Bell (American).....dis 25 %

Brackets.—Shelf.....dis 60&10 @ 65&10 %
Bright Wire Goods.....dis 65&10&10 %
Brad Rings.—Union Nut Co.....dis 50&20 %
Sargent's.....dis 60&10 %
Hotchkiss'.....4¾ in., $7·25 net

Bung Hole Borers.
Common and Ring.....dis 20&10 %
Ives' Tap Borers.....dis 10&10 @ 25 %
Enterprise Mfg. Co.....dis 30 %

Butchers' Cleavers.
Hunnason & Beckley Mfg. Co.....dis 30&10 %
Bradley's.....dis 25 %
Beatty's.....dis 20 %

2	3	4	5	6	7	8	9
$19·00	$21·00	$24·00	$27·00	$30·00	$33·50	$36·50	$40·00

Hart Mfg. Co.....dis 45&10 %

0	1	2	3	4	5	6
$25·25	$29·75	$34·25	$38·75	$43·25	$48·50	$54·00

Butts.
Wrought Brass.....dis 30 %
Cast Brass.....dis 30 %
COMMON CAST, NOT DRILLED.
Fast Joint, Narrow,.....New list July dis 30&10 %
" " Broad " " dis 40&10 %
" " Jap'd " " dis 35&10 %
Loose Joint, Narrow and Broad " " dis 50&10 %
" " " Jap'd " " dis 45&10 %
Parliament Butts & Mayer's Hinges " " dis 45&10 %
Loose Pin.....dis 45&10 %
" Japanned " " dis 50&10 %
Loose Pin, Jap'd, Plated Tips.....dis 50&10 %
Drilled and Wired.
Fast Joint, Narrow.....New list July 1, dis 25&10 %
" " Broad.....dis 35&10 %
Fast Joint, Broad, Japanned, New list July 1, dis 30&10 %
Loose Joint.....new list July 1, dis 45&10 %
" " Japanned.....dis 45&10 %
Parliament & Mayer's Hinges.....dis 30&10 %
Loose Pin.....dis 30&10 %
" " Japanned.....dis 50&10 %
" " Plated Tips.....dis 45&10 %
Union Mfg. Co.'s Fancy Butts.—
Figured Enameled Loose Joint.....dis 55&10 %
Nickel Plated " " .....dis 33½&10 %
Boston Finish, Plain.....dis 50&5 %
" " with Iron Acorns.....dis 75&5 %
" " with Sil'd " .....dis 65&5 %
WROUGHT IRON.
Fast Joint, Narrow.....dis 50&5
" Lt. Narrow.....dis 25&5
" Broad.....dis 35&5
Loose Joint, Broad.....dis 40&5
Table Butts, Back Flaps, &c.....dis 3 &5
Inside Blind, Regular.....dis 30&5
" " Light.....dis 40&5
Loose Pin Wrt.....dis 35&5
Am. Spiral Spring Butt Co., list May 1st.....dis 20 %
Union Spring Hinge Co.....dis 20 %
Blind Butts, Parker.....dis 65&10 %
" Palmer.....dis 40 %
" Seymour.....dis 60&10 %
" Shepard.....dis 60 @ 65&10 %
" Lull & Porter.....dis 60 %
" Nicholson.....dis 45&10 %
" Huffor.....dis 33½&10 %
" Garretson, No. 1.....dis 60 %
" Clark's, Nos. 1, 2 and 5.....dis 65&10 %
" Clark's No. 3.....dis 70&10 %
" " Nos. 2 4, 4½, 6, 8, 10.....dis 45 %

Can Openers.
Messenger's Comet.....per doz $3·00 dis 20 %
American.....per doz 2·25 dis 40 %
Lyman's.....per doz 3·75 dis 20 %
No. 4, French.....per doz 2·25 dis 40 %
No. 5, Iron Handle.....der doz 2·25 dis 40 %
Sprague's.....Nos. 1 2 3 4
Per doz $4·00 4·50 5·00 9·00 dis 55&10 %
Star.....per doz $5·00 dis 2 4&10 %
Eureka.....per doz $3·50 net
Sardine Scissors.....per doz $7·00 dis 40 %

Caps—Percussion, per 1000.
G. D.....37 @ 40c
Ely's E. B.....1-4s, 55c.; 1-10s, 70c. gold
" Double Waterproof, 1-4s, $1·45; 1-10s, $1·32½c., gold
Colt's.....1-10s 80c. gold

Carpet Sweepers.
Upton.....each $2 75 net
Welcome.....each 2 75 net

Cartridges.—Metallic.....dis 57½ @ 60 %

Cards.—Horse and Curry.....dis 30&10 %
Cotton.....dis 10&10 %
Wool.....dis 15&10 %

Carpet Stretchers.
Cast Steel, Polished.....per doz $5·00 dis 30 %
Cast Iron, Steel Points.....per doz $2·00 dis 45&5 %

Casters.
Bed.....dis 30&10 @ 40 %
Plate and Shallow Socket.....dis 40&10 %
Deep Socket.....dis 40 %

Cattle Leaders.....new list dis 60&10 %

Chain
Kingman Coil.....net gold

₩ ℔	11/8	8/8	7/8	6/8	5/8	4/8	3/8	2/8	1/8	7c
	9-16		5-16		7-16					

Trace, 6½-10-2.....by the cask, ₩ pair, gold 52c
Trace, 7-10-2.....by the cask, ₩ pair, gold, 62c
German Halter Chain.....dis 20 @ 25 % gold
German Coil.....dis 20 @ 25 % gold
Galvanized Pump Chain.....₩ ℔ 13c
Jack Chain, Iron.....dis 50&10 %
" Brass.....dis 60&10 %

Chalk.
White.....₩ gross, 57c net
Red.....₩ gross, 90c net
Blue.....₩ gross, $1·00 net
White Crayons.....₩ gross, 16¼c net

Chisels.
Socket Framing, Douglass, Extra.....dis 60&10 %
" " Crossman.....dis 50&15&10 %
" " Buck Bros.....new list dis 15 @ 17½ %
" " Hart Mfg. Co.....dis 60&10 %
" " Merrill.....dis 60&10 %
" Firmers, Douglass, Extra.....dis 60&10 %
" " Crossman.....dis 50&10&10 %
" " Buck Bros.....new list dis 15 @ 17½ %
" " Hart Mfg. Co.....dis 60&5 %
" " Merrill.....dis 60&10 %
Socket Corner.....dis 60&10 %
Tanged Firmers.....dis 40 %
" " Butcher's.....$5·50 to £ gold
" " Newbould's.....$5·50 to £ gold
" " Spear & Jackson's.....$5·00 to £ gold
" " Buck Bros (Shank).....$5·50 to £ gold

Clamps.
Iron, Providence Tool Co.'s.....dis 20 %
" Adjustable, Gray's.....dis 20 %
" " Lambert's.....dis 2½ %
" " Snow's.....dis 40&5 %
" " Hammer's.....dis 10 %
" Cabinet.....dis 60&10 %
Saw Clamps.....see vises

Clips, Axle.
Norway or Best.....dis 30 @ 40 %
Superior.....dis 50 @ 55 %

Coal Shovels.

Wrought Iron.	Nos. 1	2	
Long Wrt. Handles	per gross, $15·00	18·00	dis 25 %
Short " "	" 12·00	14·00	dis 25 %
Wood Handles	" 12·00	14·00	dis 25 %
Gem (Edgar's Pat.)	15·00	18·00	dis 25 @ 30 %

Cast Iron, Iron Handle.....per doz, 75 @ 80c. net
" " Wood Handle.....per doz, $1·00 net

Coal Hods.

Linen.	14	15	16	17	18	
Regular, Jap'd	per doz, $12·00	13·75	15·50	15·50	16·00	dis 60&10 %
Regular, Gal'd	" 15·00	16·00	17·50	19·50	22·50	dis 50&10 %
Ladies' Favorite, Jap'd	₩ doz 15·00	16·00	16·00	18·00	20·00	dis 50 %
Ladies' Favorite, Galvanized	" 19·00	20·00	22·00	25·00		dis 45 %

Funnel Hods.	Nos.	15	16	17	
Oriental, Japanned	₩ doz.	$16·50	18·00	20·00	dis 50 %
" Galvanized	"	21·50	22·50	24·00	dis 40 %
Morning Glory, Jap'd	"	16·50	18·00	20·00	dis 50 %
" " Gal'd	"	21·00	22·50	24·00	dis 40 %
Iron Clad, Jap'd	"		21·50		dis 60&10 %
" " Gal'd	"		22·50		dis 50&10 %

Sidney Shepard & Co.'s new list.....dis 10 %
Cockeyes.....1¾ in., 33c.; 1¾ in., 35c.; 1¾ in., 36c. net
Cocks.
Brass Plugging.....dis 40 %
Lock and Globe.....dis 40 %
Lever Bibbs.....dis 40 %
Ale and Beer.....dis 45&10 %

Coffee Mills.
Board and Box.....dis 15 @ 20 %
Brighton.....dis 20 %
Increase Wilson's.....dis 20 %
Selsor's Pat.....$9 50, $10 50—dis 25 %
American (Enterprise Mfg. Co.).....dis 20 %
French Steel.....dis 20 %
The Swift.....dis 20 %

Compasses and Dividers.
Bemis & Call Co.'s.....dis 35&10 %
Cook's.....dis 15 %
Excelsior.....dis 40 %
Peck Stow & Wilcox.....dis 25 %
Miller's Patent.....dis 35&10 %

Coopers' Tools.
Bradley's.....dis 15 @ 20 %
Chas. E. Little.....dis 20 @ 25 %
Swan & Brombacher.....dis 15 @ 20 %

Corkscrews.
Cork Knives and Cutters.....dis 25 %

Crow Bars.
Cast Steel.....₩ ℔ 11c. net
Iron, steel points.....₩ ℔ 5c

Crucibles.—Gautier & Co.....₩ No. 6 5½c

Curling Irons, &c.
⅛, ¼, ⅜ in., $1·50, $2·00, $2·40.....dis 10 %
Curling Tongs.....₩ doz $6 50—dis 15 %
Pinching Irons.....₩ doz 7 50—dis 20 %

Curry Combs.
Hotchkiss' & Kellogg's, Iron & Brass, old list.....dis 40 %
Fitch's (List of No 240, $4).....dis 25&10 %
Rubber.....₩ doz., $9·00—dis 15 %
Wood Tooth (Fuller Bros.).....per doz $2·25 net
Curtain Pins.—Silvered Glass.....new list dis 15 %

Cutlery.
American Table } Meriden } New list Jan. '75, dis 25 %
American Pocket } Cutlery Co } .....dis 30 %
Am. Pocket—Hunnason & Beckley Mfg. Co.....dis 30&10 %
Am. Miller Bro.'s Cutlery Co.....dis 25 %
Naugatuck Cutlery Co.....dis 25 %

Dippers.
Britannia.....per doz 75c—dis 30 %; by bbl. dis 33½ %
Cocoa, Plain.....per doz $2·25—dis 20 %
" Rimmed.....per doz $2·75—dis 20 %

Dog Collars.
Embossed Gilt.....dis 20 %
Leather.....dis 30 %
Brass.....dis 25 %

Door Springs.
Rod, Torre's.....₩ doz $2·50 net
" Gray's.....₩ doz $2·50 net
" Johnson's.....₩ doz $3·00 net
Coil Springs, Gem.....Nos. 1 2 3
Per dozen.....$3·50 $2·50 $2·00, dis 10 %
Challenge.....Nos. ₩ 7 6
Japanned.....per doz $2·00 2·50 3·50
Coppered.....per doz 4·00 4·50 5·00 } dis 10 %
Galvanized.....per doz 3·50 4·00 4·50
Nickeled.....per doz 5·50 6·00 7·00
Philadelphia.....5 in., $5·00; 8 in., $7·00 dis 15 %
Barker's Concealed.....dis 15 %

Drawing Knives.
Crossman's No. 1.....dis 50&15&10 %
Douglass, Extra.....dis 60&10 %
Hart Mfg. Co., No. 1.....dis 60 %
Merrill.....dis 60&10 %
Nobles Mfg. Co.....dis 15 %
Bradley's.....dis 25 %
Adjustable Handle.....dis 15 %

Drills and Drill Stocks.
Blacksmiths'.....each $2 00 net
" Self-Feeding.....each $6 00 net
Breast, P. S. & W.....dis 25 %
" Aiken's.....dis 25&10 %
" Hotchkiss.....dis 10 %
" Wilson's.....dis 10 %
" Miller's Falls.....dis 25 %
Ratchet, Merrill's.....dis 20 %
" Ingersoll's (old list).....dis 35 %
" Whitney's.....dis 20 %
Ratchet, Weston's.....dis 20 %
" Moore's Triple Action.....dis 20 @ 25 %
Wilson's Drill Stocks.....dis 10 %
Automatic Boring Tools.....each $2·75—dis 20 %

Drill Chucks.
Danbury.....each 10·00, dis 20 @ 25 %
Morse's Beach Patent.....dis 30 %
" Ad. staple.....each $10·00, dis 30 %

Egg Beaters.
Monroe's.....8 in. 10 in.
Per doz $8·00 9·00.....dis 10 %
Dover.....₩ doz $5·00—dis 20 %
National.....₩ doz $4·50—dis 20 %
Peerless.....₩ doz $3·00—net

Emery.
Genuine Chester—Regular Nos.....₩ ℔ 8c } dis 10 %
" Flour and FF.....₩ ℔ 4c }
Washington Mills—Regular Nos.....₩ ℔ 8c
" Flour.....₩ ℔ 5c
Wellington Mills, Grain.....₩ ℔ 10c. net
" Flour.....₩ ℔ 8c. net

Enameled and Tinned Ware.
Kettles.....dis 30 @ 40 %
Sauce Pans.....dis 25 %
Glue Kettles.....dis 25 %
Tinned Saucepans.....dis 25 %

Escutcheons.
Door Lock.....Same discounts as Door Locks
Brass Thread.....dis 60&10 %
Wood.....dis 25 %

Faucets.
Fenn's.....dis 50 %
" Cork Stops.....dis 40 %
Star.....dis 55&10 %
Frary's Patent Petroleum.....dis 15&10 %
Taylor's Pattern " .....dis 30&10 %
Wood and Metallic.....dis 40 %
Wood, Cork Lined.....dis 60 @ 65&5 %
Enterprise Mfg. Co., Self-Measuring.....dis 20 %

Feiles Pintes.—₩ ℔ 15c; dis 25&10 %

Files.
American File Co.....$5 00 to £ currency—dis 20 %
Arcade File Works.....$5·00 to £ currency
Auburn File Works.....$5 00 to £ currency
Nicholson.....new list, Jan. 1, 1875, net
Hartford File Co.....$5 50 to £ currency—dis 10 %
L. B. Heller & Co.....$5 00 to £ currency
Heller & Bros.....$5 00 to £ currency
Johnson & Bro.....$5 00 to £ currency
" Western".....5 00 to £ net
Wheeler, Clemson & Co.....$5 00 to £ currency
Rothery's.....$5 to £ currency
J. & Riley Carr.....5 25 to £ gold
" Horse Rasps.....5 50 to £ gold
Stubs'.....5 50 @ 9 00 to £ gold
Butcher's.....5 25 to £ gold
Walter Spencer & Co.'s "Diamond".....5 00 to £ gold
Spear & Jackson's.....5 00 to £ gold
Jowitt's.....4 50 to £ gold
Newbould's.....5 25 to £ gold
W. K. & C. Peace's "Imperial".....5 25 to £ gold
R. Ibbotson.....5 00 to £ gold
Turton Bros. & Matthews.....$5 50 to £ currency
Fisher's.....4 75 to £ gold
Goodlad's.....4 00 to £ gold
Moss & Gamble.....5 25 @ 5 50 to £ gold
Thos. Turner & Co. (Peter A. Frasse & Co.).....5 00 to £ gold
" Horse Rasps.....5 25 to £ gold
"Philo Sheffield," P. T. Co.....5 00 to £ gold
Limet & Co. (French).....4 25 to £ gold

Fluting Machines.
Mrs. Coles' Pony, 4 in., $4·75; 5 in., $5; 6 in., $5·50; 7 in., $6
Knox with 4-inch Rolls.....5 00 each net
" " 6 " .....5 50 each net
" " 8 " .....7 25 each net
O. K.....6 50 each net
Peerless, 4-inch Rolls.....4 00 each net
" 5 " .....4 75 each net
Excelsior, No. 1.....4 75 each net
" No. 2.....6 50 each net
Diamond.....7 50 each net
Champion, 6 inch rolls.....6 00 each net
" 4 inch rolls.....5 00 each net
Climax 4-inch Rolls.....3 00 each net
" 6 " .....4 50 each net
" 8 " .....6 00 each net
Empire.....4 00 each net
Eureka, No. 1, 7-inch Roll.....8 00 each net
" No. 2, 5-inch Roll.....6 00 each net
Defiance.....4 in., $3·50; 6 in., $4·00; 8 in., $6·50 each net
K. F. M., 4½-inch Roll.....5 50 each dis 15 %
" 6-inch Roll.....6 00 each dis 15 %
Myers' Fashion Fluter, 4½ inch Rolls.....2 75 each net
" Convex Brass Fluter, Sad Iron attachment.....per doz $15·00
Domestic Fluter.....$1·00 each net
Geneva Hand Fluter.....$15 00 per doz net

Fluting Scissors.—dis 25&10 %

Forges.
"Empire" (W. P. Kellogg & Co.).....dis 20 %

Forks.
Hay, Manure & Spading.....dis 30 %
Plated A 1.....dis 40&5 %

Fry Pans.
Burnished, P. S. & W., new list.....dis 40 %
₩ doz.....$3·00 3·75 4·25 4·75 5·25 6·00 7·00 8·00 9·00
No.....0 1 2 3 4 5 6 7 8

Gauges.
Marking.....dis 45&10 %
Wire.....dis 10 %
" Smith's Patent.....per doz $15·00, dis 40 %

Gimlets.
Nail and Spike.....dis 25&10 %
"Bee" Gimlets.....per gross, $12·00, dis 25 %
Double Cuts, Shepardson's.....dis 30&10 %
" " Hartwell's.....dis 40 %
" " Ives'.....dis 25 %
" " Douglass'.....dis 25&10 %

Glue Pots.
Tinned and Enameled.....dis 25 %
Family, Howe's "Eureka".....dis 25 %
" L. E. & C.'s "Handy".....dis 25 %

Grind Stone Fixtures
Sargent's Patent.....dis 65&11 %
Reading Hardware Co.....dis 70&10 %
J. F. Green & Bro.....dis 40 %
Hart Mfg. Co.'s.....dis 60&5&10 %
Rick Bros.....dis 45&5 %

Hammers.
Emmet Hammer Co.'s Handled.....dis 25 %
" Sledge & Stone.₩ ℔ 40c.; dis 40 %
Haydole's.....dis 16⅔&10 %
Henry Hammonds' (Haydole's List).....dis 12 %
Cheney's.....net @ dis 5 %
Verree.....dis 5 %
Yerks & Plumb.....dis 30 %
Magnetic Tack.....dis 25&10 %
Warner & Noble's.....dis 10 %

Hand Cuffs and Leg Irons.
Tower's Hand Cuffs, $4 00 per pair.....
" Leg Irons $4 50 per pair.....} dis 25 %
Providence Tool Co.'s Hand Cuffs $15 per doz.....
" " Leg Irons $5 " .....} dis 10 %

Handles.
Door or Thumb Latches—
Nos. 0 1 2 3 4
Per doz $1·80 1·00 1·15 1·35 1·50—dis 60 %
Roggin's Latches.....40c. @ 50c. net
Brouzed Iron Drop Latches.....per doz $1·00 @ 1·20 net
Wrought Chest.....dis 60&10 %
Surface Chest.....dis 65&10&10 %
Flush Chest.....dis 60&10&10 %
Lifting.....dis 60&10 %
Coffin.....dis 50&10 @ 60&10 %
Saw and Plane.....dis 25&10 %
Hammer and Hatchet.....dis 10 %
N. Carolina Handle Co.....dis 15 %
Brass Awl.....per gross $3 50—dis 20&10 %
Hickory Firmer Chisel, ass'td.....5 25—dis 20&10 %
" " " large " .....6 50—dis 20&10 %
Apple " " ass'td " .....6 00—dis 20&10 %
" " " large " .....7 50—dis 20&10 %
Socket " " ass'td " .....8 50—dis 20&10 %
" Framing " " " .....7 00—dis 20&10 %
File.....4 00—dis 20&10 %
Auger.....6 50—dis 20&10 %
" large " .....9 00—dis 20&10 %
Patent Auger, Ives'.....dis 25&10 %
" " Douglass'.....per set $1 25—dis 10 %
" " Swan's.....per set $1 00—dis 20&10 %

Hangers.
Barn Door.....dis 65&10 %
" Anti-Friction" No. 1, $1·25; No. 2, $1·50 ₩ pr. dis 30&5 %
Novelty.....dis 40 %
Challenge.....dis 40 %

Harness Snaps.
Henshaw's.....dis 25&10 %
Judd's.....dis 40 %
Fitch's (Bristol).....dis 30 %
Hotchkiss'.....dis 10 %
Andrews'.....dis 25 %
Sargent's.....dis 30&10 %
New York Wire.....dis 30&10 %

Hatchets.—Isaiah Blood.....dis 15 %
Shingling, Nos. 1 2 3.....₩ doz $6 25 8 00 9 75
Claw, " 1 2 3.....₩ doz 7 25 8 50 9 25
Lathing, " 1 2 3.....₩ doz 7 50 8 00 8 50
Hunt's.....dis 15 %
Shingling, Nos. 1 2 3.....₩ doz $7 25 8 00 8 75
Claw, " 1 2 3.....₩ doz 7 25 8 50 9 25
Lathing, " 1 2 3.....₩ doz 7 50 8 25 9 00
Hurd's.....dis 30 %
Shingling, Nos. 1 2 3.....₩ doz $8 00 8 50 9 00
Claw, " 1 2 3.....₩ doz 9 00 9 50 10 00
Lathing, " 1 2 3.....₩ doz 8 00 8 50 9 00
Newark's Edge Tool Co.'s.....dis 25 %
Shingling, Nos. 1 2 3.....₩ doz $6 50 7 00 7 50
Claw, " 1 2 3.....₩ doz 7 25 7 75 8 25
Lathing, " 1 2 3.....₩ doz 6 50 7 00 7 50
Yerres & Plumb.....dis 20 %
Shingling, Nos. 1 2 3.....₩ doz $7 00 7 50 8 00
Claw, " 1 2 3.....₩ doz 7 50 8 00 8 50
Lathing, " 1 2 3.....₩ doz 7 00 7 50 8 00
Simmon's.....dis 15 %
Shingling, Nos. 0 1 2 3.....₩ doz $7 50 8 00 8 50 9 00
Claw, " 1 2 3.....₩ doz 9 00 9 50 10 00
Lathing, " 1 2 3.....₩ doz 8 00 8 50 9 00
Broad, " 1 2 3.....₩ doz 9 00 10 00 12 00
" " 4 5 6.....₩ doz 14 00 16 00 18 00
" " 7 8.....₩ doz 30 00 32 00
Elephant.....dis 30 %
Shingling, Nos. 1 2 3.....₩ doz $8 00 9 50 9 00
Claw, " 1 2 3.....₩ doz 9 00 9 50 10 00
Lathing, " 1 2 3.....₩ doz 8 00 8 50 9 00
J. P. Verree & Co.....dis 6 %
Shingling, Nos. 1 2 3.....₩ doz $7 00 7 50 8 00
Claw, " 1 2 3.....₩ doz 7 50 8 00 8 50
Lathing, " 1 2 3.....₩ doz 7 00 7 50 8 00
Underhill's.....dis 10 %
Shingling, Nos. 1 2 3.....₩ doz 7 25 8 00 8 75
Claw, " 1 2 3.....₩ doz 7 75 8 50 9 25
Lathing, " 1 2 3.....₩ doz 12 00 11 00 18 00
M. H. Jones & Co.....dis 25 %
Shingling, Nos. 1 2 3.....₩ doz $8 00 8 50 9 00
Claw, " 1 2 3.....₩ doz 9 00 9 50 10 00
Lathing, " 1 2 3.....₩ doz 8 00 8 50 9 00

Hay Knives.—"Lightning".....per doz $30·00 net

Hinges.
Gate, Western.....₩ doz $6·25—dis 60&10 %
" N. E.....
" N. Y. State.....₩ doz 7·20—dis 60&10 %
Rolled Plate.....dis 65&10 %
" Raised.....dis 65&10 %
Wrought Strap and T.....dis 55 %
Providence Plate, } 6 and 8 in. 11c ₩ ℔ } .....
} over 8 in. 9½c ₩ ℔ } .....dis 30 %
Screw Hook and Strap.....} 8, 10, 12 in. 6½c } .....net
} 14 to 36 in. 5½c }
Heavy Welded Hook.....} 8 to 12 in., 6½c } .....net
} 14 in & up, 6c }
Screw Hook and Eye.....} ⅝ to 1 in., 8½c } .....net
} 9½c }
} 1¼ in. 11½c }

Hoes.
Solid Shank, C. S.....₩ doz $8 00—dis 30 %
Socket.....₩ doz 9 00—dis 30 %
Riveted Eye.....₩ doz 5 00—dis 30 %
Grub.....dis 35 %
Planters.....dis 15 @ 20 %
Scovill Pattern.....dis 10 %
Lane's C. S. Cresent, American Pattern.....dis 5 %
" " " Scovil Pattern.....net

Hooks.
Bird Cage.....dis 60&10 @ 70&10 %
Cotton.....dis 50 %
Belt.....dis 55 @ 60 %
Bench—Hotchkiss' $5 00 ₩ doz.....dis 10 %
" Weston's No. 1, $8·00; No. 2, $7·00 per doz net
" McGill's.....$8 00 per doz, dis 10 %
" Skinner's.....per doz $6·25, dis 20 %
Clothes Line, Harness, Wardrobe, Hat and Coat, Ceiling.....} Hart's list.....dis 60&10&10 %
} Sargent's list.....dis 60&5&10 %
} Reading list.....dis 35&10 %
Wrought Staples and Hooks and Staples.....dis 70&10 %
Wire Screw Hooks and Eyes.....dis 65&10&10 %
Grass.....dis 2½ %
Whittemore—Patent.....dis 33½ %
Hooks and Eyes—Malleable Iron.....dis 60&10&10 %
" " Brass.....dis 60&10&10 %

Horse Nails.

Nos.	5	6	7	8	9	10
Ausable.....₩ ℔	30c	27c	25c	24c	23c	22c
" P't'd & Pol'd.. "	31c	28c	26c	25c	24c	23c
" & Blued.. "	31c	28c	26c	25c	24c	23c
Cortland.....**	29c	26c	24c	23c	22c	21c
Buffalo Forged.....**	31c	28c	26c	25c	24c	23c
Globe, P't'd & Pol'd.. "	31c	28c	26c	25c	24c	23c
National, Pointed and Polished, Pat. Fin.. "	29c	25c	23c	22c	21c	20c
National, Pointed and Polished. Ex. Fin.. "	30c	27c	25c	24c	23c	22c
Perkin's P't'd—Black.. "	29c	25c	23c	22c	21c	20c
Perkins' Pointed and Polished.....**	30c	26c	24c	23c	22c	21c
Perkins' Pointed and Blued.....**	30c	26c	24c	23c	22c	21c
Putnam.....**	29c	25c	23c	22c	21c	20c
Vulcan, P't'd & Blued.. "	31c	28c	26c	25c	24c	23c

Star brand, 16c.; Morgan.....14c
Putnam.....3000 lbs., dis 5 %
Ausable, National and New London.....1000 lbs., dis 5 %
Perkins' and Vulcan.....1000 lbs., dis 7½ %
Perkins', Vulcan and Globe.....500 lbs., dis 5 %

Horse Shoes.
Burden.....
R. I. Horse Shoe Co., Perkins Pattern.....₩ keg, $ .....
" " " R. I. Pattern.....₩ keg, 4·87½
Mule Shoes.....₩ ke

Sieves.—Mann's Patent.....dis 30 @ 35 %

14	16	18	20	24	30 mesh
Iron...$4·00	4·00	4·25	4·50	4·75	6·50 ₩ doz
Plated. 4·75	5·00	5·25	5·50	5·75	8·50 "

Wood Rims.....18 mesh, small, $1·50 per doz, dis 10 %
" " " Regular, 1·20 per doz, dis 10 %

Shears and Scissors.
Cast Steel.....dis 75&10 %
Cast Iron.....New 1st July 15.....dis 40 %
Heinisch Sons' Trimmers and Scissors.....dis 65 %
" " Standard quality Shears and Trimmers.....dis 40 %
Seymour's Straight Trimmers.....dis 60&10 %
" Scissors.....dis 50 %
Pruning.....der doz $10 00—dis 35 %
Barnard's Lamp Trimmers.....per doz $3·75

Sheaves.
Sliding Door, M, W, & Co. list.....dis 40&5&2 %
" R. & E. list.....dis 5 & 5&2 %
" Patent Roller.....dis 25 %
" " " Hatfield's.....dis 30 %
" Russell's Anti-Friction.....dis 50&2 %
Sliding Shutter, R & E. List.....dis 30&5&2 %
" " Sargent's List.....dis 55&10 %

Shovels and Spades.
Ames.....dis 30 %
Birmingham Shovel Co.....dis 15 %
Rowland's.....dis 25 %
Old Colony.....new list dis 10&5 %
Middleboro' Shovel Co.....new list dis 20 %
C. K. Jennings & Co.....New list dis 30&10 %
Dunning & Shovels and Scoops.....dis 20&7½ %

Shovels and Tongs.
Iron and Brass Head, R. & E. list.....dis 50&10&2 %
" Hart's.....dis 55&2&10 %
Polished Steel.....dis 50&10&2 %

Skates.
Barney & Berry's
N. Y. Club.....₩ pair $2·75
B. & B. Club....." 3·50
All Clamp....." 4·25 } dis 25 %
Rink....." 8·00
Florence Steel.....$1·00 dis 25 %
" Spring.....3·00 dis 30 %
" All Clamp.....3·50 dis 30 %
Peck & Snyder's—
No. 1. Blued.....per pair $3·00
No. 2. Nickel Plated.....per pair 6·00
No. 3, " " extra..per pair 8·00
Clipper Club Blued.....per pair 3·50 } dis...25 %
" " Full Pol'd....per pair 4·50
" " and Nickel Plated.....per pair 6·00

Acme Club Skates.—Nos. 5 7 10 12 14
Pair $4·00 5·00 7·00 7·50 8·00 dis 20 %

Slates.
Square Frames, Round Cornered, by case.....dis 65&10 %
Less than a case.....dis 65 %

Spoke Shaves.
Iron.....dis 33⅓&10 %
Wood.....dis 30 %
Bailey's.....dis 25&10 %

Spoke Shave Irons.
Spear & Jackson's.....$5·00 to £ gold

Spoons.
Tinned Iron.....dis 10 %
By the case.....dis 30 %
Basting.....dis 10 %
Britannia.....£ ₩ 50&25 @ 55 %
" Boardman's, new list.....dis 55 %
Rogers & Bro., A 1.....dis 40&5 %
Derby Silver Co.....dis 40&5 %
Holmes, Booth & Haydens.....dis 40&5 %
Nickel Silver Co.....dis 40 %
German Silver.....dis 30&2½ %
Tin (P. S. & W.)—
Teas.....$1·50 ₩ gross, net
Tables.....2·75 " net

Stocks and Dies......dis 5&10 %

Stone.
Hindostan Stone.....₩ ₺ 6c }
" Axe Stone.....₩ ₺ 8c } dis 30&10 %
" Slips.....₩ ₺ 10c }
Sand Stone.....₩ ₺ 6c—dis 20&10 %
Washita Stone.....No. 1, ₩ ₺ 30c net
" .....No. 2, ₩ ₺ 25c net
" Slips.....No. 1. ₩ ₺ 60c net
Arkansas Stone.....No. 1, ₩ ₺ $1·35 net
" Slips.....No. 1, ₩ ₺ $2·50 net
Grindstones. Family, J. F. Green & Bro.....dis 20 %
" Loring's.....dis 10 %

Stove Polish.
Joseph Dixon's.....₩ gross, 6 00
Gem.....₩ gross $4·25 @ 4·50 net
Gold Medal.....₩ gross $6 00 dis 25 %
Rising Sun.....per gross $5·75 net

Squares.
Steel.....dis 50 %; full cases, dis 50&10 %
Iron.....dis 50 %; full cases, dis 50&10 %
Nickel Plated.....add $2 50 @ $4 00 ₩ doz net
Try Squares and T Bevels.....dis 45&10 %
Star Try Squares and Bevels.....dis 30 @ 35 %
Disston's Try Squares No. 1.....dis 30 %
" No. 2.....dis 45 %
" Improved, Nos. 1 & 2.....dis 30 %

Tacks, Brads, &c.—List of January 1, 1876.
Tacks, Half Weight, American.....dis 75&10 %
" Full " " .....dis 50&10 %
" Half " Swedes.....dis 65&10 %
" Full " " .....dis 30&10 %
" Carpet, Am. and Swedes.....dis 10&10 %
" " Leather Head.....dis 10&10 %
" Copper.....₩ ₺ 45c. dis 10 %
Brads, Half Weight.....dis 50&10 %
Shoe Nails—

4-8ths and longer, 9c.; 3½-8ths, 9½c. ₺ ₺, dis 10 %					
½	⅝	¾	1	1¼ in. and over.	
25	23	17	13	13	11c. ₩ ₺, dis 10 %

Double Pointed Tacks.....dis 33⅓&10 %

Tapes, Measuring.
American Flask and Cap Co.....dis 20 %
Eddy's.....dis 20 %

Tea Trays.
American Tea Tray Co.....dis 15 %

Thermometers.
Tin Case.....dis 50&10 %

Toe Calks.
Winsted.....₩ ₺ 13c., dis 10 %

Tobacco Cutters.
Enterprise Mfg. Co. (Champion).....dis 20 %
Wood Bottom.....per doz $12—dis 25&10 %
All Iron.....per doz $19·50—dis 25&10 %

Tinners' Tools and Machines.
P. S. & W.....dis 10 %

Traps.
Game, Newhouse.....dis 25 %
" Peck, Stow & Wilcox.....dis 30 %
" Hotchkiss.....old list dis 30 %; new list dis 10 %
" Blake's Patent.....dis 30 %
Mouse, Wood Choker.....₩ doz holes. 15 @ 16c
" Patent Chocker (Union Nut Co.).....₩ doz holes 16 @ 18c net
" Round, Wire.....₩ doz $1 50 to 2 00 net
" Square, " .....₩ doz 2 00 to 2 50 net
" Cage, " .....₩ doz 2 50, dis 10 %
" Patent Self Setting.....per doz holes 22c net

Trowels.
Lothrop's Brick and Plastering.....dis 10 %
Disston's Brick and Plastering.....dis 12½ %
Rose's Brick.....dis 5 %
Brades' Brick.....gold. dis 10 %
Worrall's Brick and Plastering.....dis 20 %
Garden.....dis 25 %

Triers.
Butter and Cheese.....dis 25 %

Ventilators (Window).
Nickel and Gilt.....per dozen $16·00 @ 18·00

Vises.
Solid Box, Trenton...4 to 16 lbs., 16c.; 160 and over, 20c
" " Wilson's.....30 to 160 lbs., 18c; 160 and over, 22c } dis 25 %
" " Peter Wrights.....16c gold
Parallel, Parker's.....dis 2 %
" Wilson's.....dis 30&10 %
" Sargent's.....dis 55&10 %
" Trenton.....dis 15 %
" Backus and Union.....dis 25 %
" Merrill's.....dis 15 %
" Fisher & Norris.....dis 15&10 %
" Buffalo.....dis 25 %
" Stevens'.....dis 15 @ 30 %
Saw Filers, Bonney's.....per doz $20·00 dis 20 %
" Steam's.....per doz $20 00 dis 20 %
" Hopkins'.....per doz $17·50 dis 10 %

Wheel Barrows.
Canal (Pugsley & Chapman).....new list dis 15 %
Coal, Garden and Stone (Pugsley & Chapman).....dis 25 %

Well Wheels.
Revised list.....dis 60&10 %

Wire.
Brass and Copper.....List of Oct. 27, 1875, net
Bright and Annealed.....Nos. 0 @ 18 dis 45 @ 50 %
" " " 19 @ 26 dis 50 @ 55 %
" " " 27 @ 36 dis 55 @ 60 %
Coppered.....₩ ₺ 0 @ 18 dis 40 @ 45 %
Galvanized, Nos. 0 to 9.....₩ ₺ 8 @ 8½c net
Galvanized, Nos. 10 to 18.....market list dis 15 @ 20 %
Tinned.....dis 25 @ 30 %
Cast Steel.....dis 15 @ 30 %
Tinned Broom Wire.....dis 35 @ 40 %
Galvanized Telegraph, Nos. 8 and 9.....₩ ₺ 9c
Galvanized Telegraph. Nos. 10 and 11.....₩ ₺ 10c
" " " 12.....₩ ₺ 10½c
Annealed Fence. Nos. 8 and 9.....dis 50 %
" Grape, " 10 to 14.....dis 50 %
Fence Staples.....₩ ₺ 7½ @ 8c
Stone' Steel Wire.....$7 00 to £ gold
Judd's Picture Wire.....dis 50 %
Clothes Line Wire.....per coil 60c. net

Wrenches.
American Adjustable.....dis 45 %
Baxter's Adjustable "S".....dis 20 %
" Diagonal.....dis 20 %
Collins & Co.'s.....dis 45 %
Coes' Genuine.....dis 40&10 %
" Pattern (Wrought).....dis 50&10 %
" (Malleable).....dis 65&10 %
Diamond Hardware Co.....dis 40 %
Lindsay's Patent.....dis 25 %
Taft's Pattern.....dis 70&10 %
Davis 'atent Duplex.....new list dis 25 %
Bemis & Call's Patent Combination.....dis 20&5 %
" Merrick's Pattern.....dis 25&2½ %
" Brigg's Patent.....dis 15&10 %
Aiken's Pocket (Bright).....per doz $10·00—dis 50&10 %

Wringers.

	Less than 3 doz	3 doz lots
Providence.....₩ doz	$7·00	$70·00
Reliance.....₩ doz	69·00	67·00
Universal—Extra.....₩ doz	72·00	70·00
Novelty.....₩ doz	72·00	70·00
Sherman.....₩ doz	72·00	70·00
Eureka.....₩ doz	60·00	58·00
Wringers without Cog Wheel..₩ doz	60·00	58·00

Stamped Tin Ware.
Common Stamped Ware.....dis 10 %
Stamped Deep and Retinned Ware.....dis 30&10 %
Japanned Tin Ware.....dis 5 %
Planished Tin Ware.....dis 20 %

METALS.

IRON.—DUTY Bars, 1 to 1¼ cents per lb., Sheet, Band, Hoop and Scroll, 1¾ to 1¾ cents per lb. Provided, that none of the above Iron shall pay a less rate of duty than 35 per cent. Pig, $7 per ton; Polished Sheets, 3 cents per lb.; Wrought Scrap, $8 per ton; Cast Scrap, $6 per ton. Railroad, 70 cents per 100 lbs. Boiler and Plate, 1¼ cents per lb.

Pig Iron—AMERICAN.

Foundry No. 1	₩ ton,	$23 00 @
Foundry No. 2	"	21 50 @ 22 00
Gray Forge	"	20 00 @ 21 00

SCOTCH.

Coltness	"	32 00 @ 33 00
Glengarnock	"	30 00 @ 31 00
Gartsherrie	"	
Eglinton	"	29 50 @ 30 50
Summerlee	"	

Bar Iron.
Am. Rehned, at mill.....2·4c.

Rails.
American, at works, currency.....₩ ton 42 00 @ 46 00
Old Rails....." 21 00 @ 22 00

Scrap.
Wrought Scrap....." 30 00 @

Bar Iron from Store.
Common Iron.
¾ to 2 in. round and square.... } ₩ ton $57
to 6 in. x ⅜ to 1 in..... }
Refined iron.
¾ to 2 in round and square.... } " 57 50 @ 60 00
1 to 6 in. x ⅜ to 1 in..... }
1 to 6 in. x ¼ and 5-16 " 62 50 @ 65 00
Shafting Iron—2½ to 4 in..... " 62 50 @ 75 50
Rods—5-16 to ⅝ round and square.. " 110 00 @ 65 00
Bands..... " 70 00 @ 72 50
Hoops—⅜ to 2 in..... " 130 00 @ 80 00
Swedish Iron.
Ordinary sizes..... " 130 00 @ 132 50
Plow size..... "

Sheet Iron.

	Common American and English.	R. G. American.	R. G. English.
Nos. 10 to 20	₩ ₺ 3¾c @ 4c	5c	5½c
21 to 24	" 4c	5½c	5½c
25 to 26	" 4¼c	5¾c	5¾c
27	" 4½c	5¾c	6c
28	" 4¾c	5c	6¼c
galvanized, 14 to 20, prime,	₩ ₺ 8½c;	20 quality	₩ ₺ 7½c
" 21 to 24	" " 9¼c	"	" 8¾c
" 25 to 26	" " 10 c	"	" 9 c
" 27	" " 10½c	"	" 9½c
" 28	" " 11¼c	"	" 10½c

Patent Polished.....₩ ₺ 14c
Russia, Nos. 8 to 16....." 15½c
" Stained, No. 1....." 14½c
Belgian.....10c
One piece Corrugated Sheet Iron Elbows.

CHARCOAL IRON.

¼	⅜	½	⅝	¾	7 inch.
12·50	8·50	4·50	5·25	6·50	per doz.

RUSSIA IRON.

1½	5	5½	6	7 inch.
5·00	7·00	9·50	12·00	14·00 per doz.

COPPER—DUTY Pig, Bar and Ingot, 5c.; old copper, 4 cents ₩ ₺; Manufactured (including all articles of which copper is a component of chief value) 45 % ad valorem.
American Ingot.....₩ ₺ 28¼ @ 28½c
English " "

SHEATHING, BRAZIERS COPPER, BOLTS, &c.
Braziers Copper, ordinary sizes, over 16 oz., per square foot.....31c ₩ ₺
Braziers Copper, ordinary sizes, 16 oz. and over 12 oz., per square foot.....33c. "
Braziers' Copper, 12 oz. per square foot.....35c. "
Circles less than 24 inch in diameter.....34c ₩ ₺
Circles, 24 inch diameter and over.....37c. "
Segment and Pattern Sheets.....34c. "
Locomotive Fire Box Sheets.....31c. ₩ ₺
Sheathing Copper, over 12 oz. per sq. ft.....33c. "
" 12 oz. ₩ sq. ft. and lighter...35c. "
Bolt Copper.....31c. "
Copper Bottoms, 33c. ₩ ₺.....net
No Copper is Sheathing except 14x48 inches, and not to exceed 34 oz. to the square foot.

O'NEILL'S PATENT PLANISHED COPPER.
14x48.
14 and 16 oz. and heavier.....37c. By the case, 36c. ₩ ₺
12 oz. and lighter.....40c. " " 39c. "
Boiler Sizes.
7 in., 14x52. 8 in., 14x56. 9 in., 14x60
14 and 16 oz. and heavier.....38c. By the case, 33c. ₩ ₺
(And all sizes not over 30 inches wide.)
30x60
14 and 16 oz. and heavier.....41c. ₩ ₺
12 oz.....44c. "

TINNING.
14x48, by the case.....8c. ₩ sheet
14x48, less than case.....10c. "
Other sizes not larger than 30x60.....24c. ₩ sq.
Larger than 30x60.....5c. "

Brass
Brown & Sharp's Gauge the Standard except for Fine Wire.

BRASS MANUFACTURERS' PRICE LIST.
October 27th, 1875.
Net cash prices for Roll and Sheet Brass, Wire, &c., for quantities of 100 pounds and over at one time. For less than 100 pounds, three cents additional.

HIGH BRASS

All Nos. to No. 28, and widths 14 in. and under	27c
All Nos. to No. 24, inclusive, and widths over 14 to 20 in., inclusive	33c
Over 20 in. to 30 in., inclusive, and widths over 14 to 20 in., inclusive	38c
½c. ₩ ₺ advance on each No. above Nos. 28 to 38, inclusive.	
All Brass thinner than No. 38 is Platers' Brass, at	45c
Sheets 24x48 in. and all sheets cut to particular sizes and lengths	33c
Printers' Rules	40c
Sheets wider than 30 in and under 40 in	40c
" " " 40 in. and over	42c
Circular sheets, in diam. from 4 in. to 14 inclusive	37c
" " " over 14 " 20, "	40c
" " " " 20 " 30, "	43c
" " " " 30 " 40, "	46c
" " " " 40 in	49c

LOW BRASS.
Four cents ₩ ₺ more than High Brass.
Gilding Metal, 7c, ₩ ₺ more than High Brass.
Platers' or Gold Metal } In Bars..... 42c
} Sawed..... 45c
} Planed or Polished..... 48c

FOR SLITTING.
Metal, in width 2 in. to ¼ in. to No. 30, inclusive, 1c. per ₺. advance.
Metal, in width 2 in. to 1 in., thinner than No. 30, 2c. per ₺. advance.
Metal, in width 1 in. to ⅛ thinner than No. 30, 3c. per ₺. advance.
Metal, in width ⅛ in. to ¼, to No. 30, 2c. per ₺. advance.
Metal, in width ¼ in. to ¼ thinner than No. 30, 5c. advance.
Metal, ¼ in. in width and less, 10c. per lb. advance

GERMAN SILVER MARKET METAL AND WIRE

	Market Metal.	Wire.
4 per cent., 12 in., to No. 26	$0·60	$0·80
6 " " "	·70	·90
10 " " "	·80	1·10
15 " " "	1·00	1·35
18 " " "	1·10	1·50
20 " " "	1·20	

German Silver Sheets over 12 in. wide, and weighing more than 10 lbs., 2 per lb., net.
Advance 2c. for each additional in., in width above 12 in., and 2c. per lb. on each No. thinner than Nos. 26 to 36 inclusive.
All German Silver thinner than No. 36 is Platers', at 50c. per lb. additional.
German Silver Scrap one-third less than net price of 12 in. Market Metal. German Silver Turnings, Filings and Chips, half the price of Scrap.

BRASS AND COPPER WIRE.

	High Brass.	Low Brass.	Glid'g and Cop'r.
Nos. 0 to 20	0·30	0·34	0·40
Nos. 21, 22, 23	0·31	0·35	0·42
Nos. 24 and 25	0·32	0·36	0·43
Brass Rods, No. 8 and larger	0·36	0·40	0·46
Wire straightened and cut, smaller than No. 8	0·40	0·44	0·50

Fancy Wire not less than 4 cents per pound advance of Round Wire.
Spring Wire, 2 cts. per lb. advance.

FINE WIRE, BY THE OLD ENGLISH FINE WIRE GAUGE.

	High Brass.	Low Brass.	Glid'g and Cop'r.
No. 26	0·41	0·45	0·51
No. 27	0·44	0·48	0·54
No. 28	0·46	0·50	0·56
No. 29	0·48	0·52	0·58
No. 30	0·50	0·54	0·62
No. 31	0·52	0·56	0·66
No. 32	0·56	0·60	0·71
No. 33	0·60	0·64	0·81
No. 34	0·64	0·68	0·91
No. 35	0·69	0·73	1·03
No. 36	0·73	0·82	1·15
No. 37	0·98	0·98	1·28
No. 38	1·28	1·28	1·58

Ten cents per pound extra for Spooling.

TUBING.

	₩ ₺
Plain to No. 20 inclusive, above ¾ in. to 1¼ in.	$ ·44
" 1¼ to 3 in. inclusive	·28
" above 3 in	·30

Nos. 21, 22, 23, two cents advance on List for each Number.
Nos. 24, 25, 26, four cents advance on List for each Number.
Above No. 26, special rates.

Plain ⅜ inch	·50
" 5-16 "	·60
" ¼ "	·80
" 5-16 "	1·20
" ⅜ "	1·60

All Mandrel Drawn Tubes, 5 cents advance on List Prices.
Fancy Tubing, 4 cents advance on List above Plain.
English, Scotch and Extra Patterns Fancy Tubing to No. 30, 9 cents above Plain.
Tubing Sawed or Cut 2 to 4 feet long, 3 cents advance on List.
Add to 2 cents ¼ cent for each additional cutting under two feet.
All Mandrel Drawn Tubes under ¾ in., 25 cents per pound advance.

ZINC TUBING.

Plain	·28
Fancy	·31
Scotch and Extra Patterns	·34

GERMAN SILVER TUBING.

4 Per cent	·85
6 "	·95
9 "	1·10
12 "	1·25
15 "	1·40
16 Per cent	1·45
18 "	1·55
20 "	1·65

MISCELLANEOUS.

Common Plain Brass Pail Ears	·39
Hose Pipes, 500 and over	·71
" under 500	·76
Door Rail	·40

SCRAP.
High Brass Scrap, 16 cents.
Low " 18 cents.
Gilding, 20 cents.
Turnings, Filings and Chips, half the price of Scrap.
Orders for Goods on this list received on or after this date, will be filled at the rate herein stated,
Terms—Net cash. No discount allowed. Interest to be added after thirty days.

ANTIMONY.....14½c. gold

LEAD—DUTY: Pig 2½ per 100 lbs.; old Lead, 1½ cent per lb.; Pipe and Sheet, 2½ cents per lb.

Spanish	7c gold
German Refined	6¾c gold
English	6¾ @ 7c gold
American	6 @ 6¾c gold
Bar	dis 10 %.....8¾c.
Pipe	dis 10 %.....9c.
Tin Lined Pipe	dis 10 %.....16½c.
Sheet	dis 10 %.....9½c.
Shot	dis 10 %. Drop, 9¾c. Buck, 10¾c.

BABBITT METAL.

N. P. U	₩ ₺ 9¾ @ 9c
A., 25c.; B, 30c.; C, 15c.; D, 12c. ₩ ₺.	

SOLDER.....No. 1. 15c.; No. 2, 14c

STEEL—DUTY: Bars, ingots, Sheets and Coils, valued at 7 cents per lb., or under, 2¼ cents; over 7 cents, and not above 11, 3 cents per lb. over 11, 8¼ cents per lb. and 10 % ad val. Railway Bars 1¼ cents per lb. Railway Bars, in part Steel, 1 cent per lb. Provided, that Metal cemented, cast or made from Iron by the Bessemer or pneumatic process, of whatever form or description, shall be classed as

American Cast Steel.

Tool	15 @ 16c
Spring	10c
Homogeneous	12½c
Tire	12½ @ 13½c
Machinery (round and square)	10 @ 11c
File	11c
Sheet	14 @ 16c
Saw Plate, mill and muley	14 @ 16½c
Saw Plate, gang and X cut	13 @ 14c
" circular as to size	18 @ 30c

Chrome Steel.

Tool	₩ ₺ 20 @ 21c
Tool, extra fine	" 40 @ 75c
Spring	₩ ₺ 12c and upward
Machinery	₩ ₺ 14c
Hammer	" 15c.
Gun or Homogeneous	" 16c

English Steel.—payable in gold, net.

Best Cast	₩ ₺ 17¾c
Extra Cast	" 14¾c
Round Machinery, Cast	₩ ₺ 10¾ @ 11¾c
Swaged, Cast	" 19¾c
Best Double Shear	" 17¾c
Blister, 1st quality	" 14¾c
" 2d quality	" 13 c
German Steel, Best	" 11¾c
do 2d quality	" 10¾c
3d quality	" 9¾c
Sheet Cast Steel, 1st quality	" 17¾c
" 2d quality	" 14¾c
" 3d quality	" 12¾c
File Steel, Flat and ½ Round	" 12¾c
" Square and Round	" 12¾c
" Mill	" 13¾c
" Taper to 4 inch	" 16c
" Taper 3 and 3¼ inch	" 18c

SPELTER—DUTY: In Pigs, Bars and Plates, $1 50 per 100 lbs.

Silesian, cash	6¾ @ 7c., gold
American "	7¾ @ 11c., currency

TIN—DUTY: Plates, Sheets, Tagger and Terne, 1·1c per lb.; Electro-galvanized Plates, 2 cents per ₺; Manufactures of, not enumerated, 35 per cent. ad val. Bars, Block and Pigs, free. Banca, subject to duty of 10 per cent.

Banca	₩ ₺ 26¼ @ 27c., currency
Straits	" ₺ 22 @ 23c., currency
English	₩ ₺ 22 @ 22½c., currency

TIN PLATES, CURRENCY PRICES.

I C 10x14. Prime Charcoal		8·75
12x12,	"	9·25
14x20,	"	9·50
I X 10x14,	"	11·00
12x12,	"	11·50
14x20,	"	12·00
D C 12½x17	"	8·25
D X 12½x17	"	9·00
For each additional X add		1·25

COKE TIN PLATE.

	Best.	2d Quality.	Ordinary.
I C 10x14	$8·50	8·00 @ 8·25	7·75 @ 8·00
I C 12x12	9·00	8·25 @ 8·50	
I C 14x20	9·25	8·50 @ 8·75	7·75 @ 8·00

TERNE PLATE.

	Prime Char.	2d qual.	Coke.
I C 14x20	$ 8·25 @ 8·50	7·75 @ 8·00	7·50 @ 7·75
I X 14x20	10·50		
I C 20x23	17·00 @ 17·50	16·25 @ 16·75	15·75 @ 16·00
I X 20x28	22·50		
I C 20x200			

ZINC—DUTY: Pig or Block, $1 50 per 100 lbs. Sheet 2½c. ₩ ₺.

Sheet	cask 10c
"	open 10¼c

Paper Stock, Old Metals, &c

(Dealers' Selling Price.)

Canvas linen	6 @
" cotton, No. 1	6¼ @ 6¾
" " No. 2	@ 3½
White linen rags, No. 1	6¾ @
" " No. 2	4¾ @
Colored	2¾ @
Mixed woolens	3¾ @ 3¾
Soft woolens	5¾ @ 6¾
Gunny bagging	2 @ 2¾
Jute Butts	2¼ @ 2¾
Kentucky bagging	3¾ @ 3¾
Book stock	4 @ 4½
Waste paper and scraps	1 @ 1½
Rope cuttings	1¾ @ 2
Kentucky Bale rope	4 @ 4½
Oakum junk, No. 1	5¾ @ 5¾
" No. 2	@ 4
Grass rope	3¾ @ 4
Tarred Shaking	1½ @ 1¾
White Cotar Cuttings, all paper	7 @
" " muslin lined	5 @
" Envelope "	7 @
Hard White Shavings, No. 1	6¼ @
Soft " " No. 1	6 @
White Shavings, No. 2	5¾ @
Mixed Shavings, part white	4 @ 4¾
Imperfections, No. 2, best folded sheets	5 @
" " 1, Heavy Stock	4¾ @
Book Stock, Mixed	3½ @
" " No. 2, light	2¾ @ 2¾
Prints	1¾ @ 2
Pure Manilas	2¾
Bogus Manilas and Hardwares	1 @ 1¾
Commons	1 @ 2
Binders' Board Cuttings	1¾ @ 1
Straw Board Cuttings	1¾ @
Woolen Tailor Clips	1¾ @
Satinet Tailor Clips	1¾ @

Old Metal.

Copper	@ 18
Yellow metal	14 @
Brass	13 @ 14
Heavy Composition	16 @ 17
Old lead, solid	6 @ 6¾
Tea lead	5¾
Zinc	@ 4¾
Pewter, No. 1	17
" No. 2	10 @ 12
Shelter	@ 6
Wrought iron	per ton $30·00
Machinery iron	per ton $17·50
Light Iron	per ton $16·00
Stove plate	per ton $13·00
Burnt Iron	per ton $11·00

Paints, Oils, etc.

Paints.

Black lamp—Coach Painters	₩ ₺ 20c
" " Ordinary	6c
" Ivory Drop, fair	15c
" " best	26c
Black Paint, in oil	Kegs, 8c.; asst'd cans, 11 c
Blue, Prussian, fair to best	50 @ 75
" " in oil	35 @ 60c
" Chinese dry	80c
" Ultamarine	25 @ 30c
Brown, Spanish	1¾c
" Van Dyke	9c
Carmine, 40	$12 00
Green, Chrome	15 @ 23c
" in oil	18 @ 25c
" Paris	good, 32c; best, 40c
" " in oil	" 30c " 45c
Mineral Paints	1¾ @ 4c
Orange Mineral	14c
Red Lead, American	9¼c
" " English	10¾c
" Venetian (N. C.) dry	2¾c
" " in oil	asst'd cans, 11c; kegs, 8½c
" Indian, dry	40c
Rose Pink	13c
Sienna, American, Raw	4c
" Burnt	4½c
" " in oil	16 @ 20c
" Raw "	15 @ 25c
Umber, Burnt	4 @ 8c
" " in oil	16 @ 21c
" Raw	3½ @ 7½c
" " in oil	16 @ 22c
Vermillion, Chinese	1 35, gold
" English	90c., gold
" Trieste	1 10 "
" American, Common	28c
White Lead, American, pure dry	10c
" " in oil	11c
White, Paris, English, prime	in bbls. 2¾ @ 2¾c
Yellow Ochre, French	2¾ @ 2¾c
" " in oil	asst'd cans, 11c; kegs, 8½c
" Vermont	in casks 1¼c
Yellow Chrome	17 @ 27c
" " in oil	16 @ 28c
Zinc White, American No. 1 dry	8c
" " 1, in oil	11c
" French (Paris)	11c
" " in oil	13c

Oils.

Linseed Raw	₩ gal. casks, 43c. bbl., 42c
" Boiled	" 46c. " 47c
Whale, Crude	
" Bleached Winter	75c
Sperm, Crude	obl. 1·65
" Winter unbleached	" 1·80
" Bleached	" 2 00
Seal, Extra Refined	"
Lard, Pure Winter	" 1·15
" Spring	" 1·05
Cotton Seed, Crude	42
" Southern Yellow	" 55c
" White	"
Neatsfoot, Winter	70c @ 1·10
Natural Lubricating	35c @ 40c

Sundries.

Asphaltum	8c
Benzine	₩ gal. 16c
Chalk	1½c
" Block	
Dryer, Patent, Am'n	ass't cans, 10½c.; kegs, 9c
" English	" 11c.; " 9c
Flocks	
Frostings	50c
Glue, White	35 @ 45c
" Sheet	30c
Glaziers' Points, Zinc	9c
Gum, Copal	30c
" Damar	27c
" Shellac, English	55c
" " Dark	50c
Litharge	10c
Pumice Stone, selected Lumps	4 @ 6c
" powdered	4c
Putty in bladders	3½c
" in bulk	3c
Rotten Stone, soft, English	8c
Spirits Turpentine	36½c
Whiting, Spanish	¾c

Glass.
French Window—1st, 2d, 3d, and 4th qualities. Per box of 50 feet.

SINGLE THICK.

SIZES.	I.	II.	III.	IV.
6 x 8 to 10 x 15	$7·50	$6·75	$6·25	$5·75
11 x 14 to 16 x 24	8·50	7·75	7·25	6·50
18 x 22 to 20 x 30	10·75	9·75	8·75	7·75
15 x 36 to 24 x 30	12·25	10·75	9·00	
26 x 28 to 24 x 36	13·00	11·50	9·75	
26 x 36 to 26 x 44	14·50	13·25	10·75	
26 x 46 to 30 x 50	15·00	14·00	11·25	
30 x 52 to 30 x 54	16·00	14·00	12·00	
30 x 56 to 34 x 56	17·25	15·50	13·50	
34 x 58 to 34 x 60	18·25	17·25	15·00	
36 x 60 to 40 x 60	20·75	18·75	17·25	

DOUBLE THICK.

SIZES	I.	II.	III.	IV.
6 x 8 to 10 x 15	$12·00	$11·00	$10 00	$9·25
11 x 14 to 16 x 24	13·75	12·50	11 75	10·50
18 x 22 to 20 x 30	17·25	15·75	14·00	
15 x 36 to 24 x 30	19·75	17·25	14·50	
26 x 28 to 24 x 36	21·00	18·50	15·75	
26 x 36 to 26 x 44	26·25	21·25	17·25	
26 x 46 to 30 x 50	24·00	21·50	18·00	
30 x 52 to 30 x 54	26·75	23·25	19 25	
30 x 56 to 34 x 56	27·75	25·00	21·75	
34 x 58 to 34 x 60	29·25	27·75	24 00	
36 x 60 to 40 x 60	33·25	30·00	27·75	

Sizes above—$12·00 per box extra for every 5 inches.
An additional 10 per cent. will be charged for all Glass more than 40 inches wide. All sizes above 52 inches in length, and not making more than 81 united inches, will be charged in the 84 united inches bracket.
Discount 50&5 %.

PRATT & CO.,
Hardware & Iron Merchants, Buffalo, N. Y.
Manufacturers of the Superior Brand,
BUFFALO FORGED HORSE NAILS.
These Nails are superior, being made with new and improved machinery and actually hammered from the very best brands of **Norway Iron.**

Orders solicited from the Trade.
G. B. WALBRIDGE & CO., New York Agents.

Francis Axe Co.
Buffalo, N. Y.
Diamond Edge Silver Steel
AXES.

FRANCIS AXE CO.
BUFFALO
DIAMOND EDGE

Steel.

THREE CLASS PRIZE MEDALS, CLASSES 1, 21, 22, Great Exhibition of Industry LONDON, 1851.

MEDAL OF HONOUR, SOCIFTY OF ARTS & INDUSTRY, LONDON, 1856.

1st CLASS PRIZE MEDAL, CLASS 1st UNIVERSAL EXHIBITION OF INDUSTRY PARIS, 1855.

LOCKER BROTHERS,

(Limited.)

SUCCESSORS TO

SAML. COCKER & SON,

(Established 1752.)

SHEFFIELD, ENGLAND

MANUFACTURERS OF

CAST, SHEAR, SHEET AND BLISTEB STEEL, OF EVERY DESCRIPTION.
BEST CAST STEEL WIRE, ADAPTED SPECIALLY FOR MECHANICAL PURPOSES:
Also for ROPES, NEEDLES, FISH HOOKS, PINS, CRINOLINE, &c.

BEST CAST STEEL FILES, SAWS, EDGE TOOLS,
HACKLES, GILLS, CARD CLOTHING, CARD TEETH, HACKLE AND GILL PINS,
FISH HOOKS, NEEDLES, &c.

ALSO

GENERAL MERCHANTS.

WM. JESSOP & SONS,

MANUFACTURERS OF

STEEL,

AND IMPORTERS OF IRON

SHEFFIELD, ENGLAND.

PRINCIPAL DEPOTS:

NEW YORK, Nos. 91 and 93 John Street..... BOSTON, No. 141 Federal.
ST. LOUIS, No. 714 North Second Street.

AGENCIES

PHILADELPHIA Jas. C. Hand & Co.... PROVIDENCE, Nightingale & Kilton.
CHICAGO Crerar, Adams & Co..... NEW ORLEANS, Folger & Co.
CINCINNATI, Augustus Wessel..... SAN FRANCISCO, Huntington, Hopkins & Co.

F. W. MOSS,

Successor to **JOSHUA MOSS & GAMBLE BROS.**

FRANKLIN WORKS, WADSLEY BRIDGE WORKS, WALKLEY WORKS, } SHEFFIELD, ENGLAND.

MANUFACTURER AND IMPORTER OF

STEEL AND FILES.

Principal Depots: 80 John St., N. Y., and 512 Commerce St., Phila.

MOSS & GAMBLE **SUPERIOR C. S. "FULL WEIGHT" FILES,**

Cast Steel Hammers and Sledges. Also, "M. & G." Anvils and Vises.

WARRANTED CAST STEEL, especially adapted for DIES and TURNING TOOLS, DRILLS, COLD CHISELS, PUNCHES and all kinds of MACHINISTS' TOOLS.
Celebrated Improved Mild Centre Cast Steel, for Taps, Reamers, and Milling Tools, Warranted not to crack in hardening Taps of any size.
Swede Spring Steel, especially adapted to Locomotive and Railway Car Springs.
English Spring and Plow Plate Steel. Also, manufacturer of

Sheet Cast Steel **Shear, German, Round Machinery, Hammer, Fork and Shovel Steel**

And GENERAL MERCHANT.

WILSON HAWKSWORTH, ELLISON & CO.,

Vienna Universal Exhibition, 1873.

THE MEDAL FOR MERIT

Awarded for Excellence & Perfection in Material & Workmanship.

W. H., E. & CO. have pleasure in announcing the Award of the MEDAL FOR MERIT for their Exhibit of Crucible Cast Steel, Files, Steel Wire, Tools, &c. This is the ONLY Award to any Exhibitor of STEEL WIRE in the British Section.

Manufacturers of

STEEL,

Steel Wire, &c.,

AND GENERAL MERCHANTS.

CARLISLE WORKS, - - - SHEFFIELD, ENG.

New York, 72 John Street. *Philadelphia, 505 Commerce Street.* } Agencies: { *Boston, 21 Oliver Street.* *New Orleans, La. 111 Gravier St.*

Isaac Jenks & Sons,

MINERVA AND BEAVER WORKS, WOLVERHAMPTON, ENGLAND.

MANUFACTURERS OF

"JENKS" SPRING STEEL, **"MINERVA"** SWEDES, AND **"ANGLO"** CAST SPRING STEEL
"JENKS" TIRE, TOE CORE, SLEIGH SHOE, BLISTER, AND PLOW STEEL;
ALSO,
"BEAVER" PLOW, TIRE, AXE, AND SHEET IRON.

VAN WART & McCOY, Agents, 134 & 136 Duane Street, N. Y.

J. & RILEY CARR,

MANUFACTURERS OF SUPERIOR

STEEL

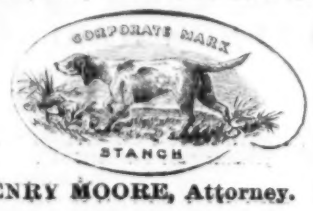
For Tools, Cutlery, Saws, Files, Augers, Gimblets, &c.; Sheet Cast Steel for SPRINGS AND STAMPING COLD;

ALSO THE CELEBRATED

DOG BRAND FILES,

Unsurpassed, if equaled in quality.

Ley Lane Works, Sheffield, England.
Warehouse, 82 John St., New York.



Established 1810. **HENRY MOORE, Attorney.**

Steel.

SANDERSON BROTHERS & COMPANY,

(LIMITED)

DARNALL WORKS, ATTERCLIFFE FORGE, } SHEFFIELD, ENGLAND.

Sole Manufacturers of the CELEBRATED

CAST STEEL,

Warranted most SUPERIOR and UNSURPASSED for

TOOLS and GRANITE ROCK DRILLS.

A full assortment of this universally approved OLD BRAND of English Steel, and

ARMITAGE'S GENUINE MOUSEHOLE ANVILS,

For Sale by

EDWARD FRITH, 16 Cliff Street, New York.

FRANCIS HOBSON & SON,

91 John Street, NEW YORK,

Sole Manufact'rs of **"CHOICE"** Extra Cast Steel.

Manufacturers of all Descriptions of Steel.

Manufacturers of Every Kind of Steel Wire.

Don Works, Sheffield, England.

S. & C. WARDLOW,

MANUFACTURERS OF THE CELEBRATED

Cast and Double Shear STEEL,

In Bars, Sheets and Coils, for fine Pen and Pocket Cutlery, Table, Carving, Butcher and Shoe Knives, Turning Tools, Dies, Files, Clock or other Springs, Saws and Tools of every variety.

SHEFFIELD, ENGLAND.

Office of S. & C. WARDLOW, 95 John Street, New York.

In calling the attention of consumers of Steel in any of the parishes above enumerated, we would respectfully assure them of our ability to supply an article that cannot be excelled in quality, temper, and adaptation in all respects to the various purposes for which it may be required. Half a century of practical experience in all departments of Steel manufacture, a long established reputation in England, and the Continent of Europe, and in the Eastern States principally of this Country, encourage us to solicit a universal trial of our Steel for the above or other purposes for which a first class Material in quality, temper, and durability is needed

JOHN NICHOLSON & SONS

MOWBRAY STEEL WORKS, Sheffield, England.

Manufacturers of all descriptions of **CAST STEEL,** especially **BEST CAST STEEL for Axes and Edge Tools.**

NEW YORK OFFICE, - - - - 88 Chambers Street.

Boston Agency, F. A. HOWARD, 38 Kilby St., Boston.

JERE. ABBOTT,

(Successor to ABBOTT & HOWARD.)

Commission Merchant.

Agent for

THOMAS FIRTH & SONS,

Manufacturers of STEEL and LOCOMOTIVE TIRES,

SHEFFIELD, ENGLAND.

N. H. HOGLUND,

SWEDISH IRON, - - - Stockholm, Sweden.

J. G. HALBACH FRANSEN,

GENUINE HALBACH STEEL, - Remscheid, Prussia.

OFFICES: { 35 Oliver Street, BOSTON. 81 John Street, NEW YORK.

G. SANDERSON & CO.,

Manufacturers of all descriptions of

STEEL.

SHEFFIELD, ENGLAND.

Particular attention is paid to quality and temper for

Files, Saws, Table and Pocket Cutlery, Augers, Shovels, &c.

ALSO STEEL of superior quality for **Turning Tools, Taps, Dies, Drills,** &c.

Hot and Cold Rolled Sheets for Clock Springs, Corset Clasps, Pens, &c.

☞ *Makers of the Celebrated ROCK BORING DRILL STEEL.*

Warehouse, 57 John Street, New York.

D. G. GAUTIER & CO.,

MANUFACTURERS OF

Hammered and Rolled STEEL of every description

JERSEY CITY, NEW JERSEY.

DUDLEY G. GAUTIER. JOSIAH H. GAUTIER.

Steel.

Sheffield Steel Works,

(Established in 1848.)

SINGER, NIMICK & CO.

Pittsburgh, Pa.,

Manufacturers of **Extra Quality Tool**

CAST STEEL,

Patent Rolled

SAW PLATES,

All descriptions of **Cast and German**

Spring and Plow Steel

Elliptic and Side Springs, Seat Springs,

AXLES, STEEL TIRE,

Plow Wings, Shares, Cultivators, Reaper Bars, ow Bars, &c., &c.

Warehouse, 83 Water and 100 First Streets.

MILLER, METCALF & PARKIN,

Crescent Steel Works,

PITTSBURGH, PA.,

Manufacturers of all descriptions of

STEEL

EQUAL TO ANY IN THE MARKET.

Office.....339 Liberty St.,

PITTSBURGH, PA.

Gunpowder.

GUNPOWDER

DUPONT'S

Sporting, Shipping, and Mining

POWDER.

DUPONT'S GUNPOWDER MILLS,

ESTABLISHED IN 1801,

Have maintained their great reputation for 75 years. Manufacture the

Celebrated Eagle Ducking, Eagle Rifle, & Diamod Grain Powder.

THE MOST POPULAR POWDER IN USE.

Also, SPORTING, MINING, SHIPPING, AND BLASTING POWDER,

of all kinds and descriptions.

For sale in all parts of the country. Represented by

F. L. KNEELAND

70 Wall Street, NEW YORK.

GUN-POWDER

LAFLIN & RAND POWDER CO.,

21 Park Row, New York,

Invite the attention of the Hardware Trade to their facilities for delivering

Blasting, Mining and Rifle

In every part of the United States.

From having agencies and magazines at all prominent points, beside our works at

Kingston, Newburgh, Saugerties and Schaghticoke, N. Y.; Moosic, Rushdale and Cressona, Pa.; and Platteville, Wis.

The superiority is well known of our brands of Sporting Powder.

Orange Rifle, Orange Ducking, Orange Lightning.

ELECTRIC BLASTING APPARATUS.

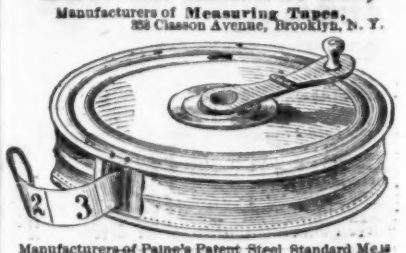
SAFETY-FUSE at wholesale.

EATON'S METAL CLOTH BINDING.

An article long been wanting to fully protect the border of Oil Cloths, Mats, etc. from being worn out, thus keeping them in good order without being continually harrassed with quality of carpet binding, which needs constant attention to keep in good order. This binding is metal, in the form of a clasp, has holes pierced, and is seven feet in length. It is easily put on, cheap, ornamental and neat. The trade supplied by **GEORGE S. EATON,** First St. cor. North Third, Brooklyn, E. D., N. Y. Box 78.

GEO. M. EDDY & CO.,

Manufacturers of **Measuring Tapes,** 258 Classon Avenue, Brooklyn, N. Y.



Manufacturers of Paine's Patent Steel Standard Measuring Tapes, for Surveyors, Engineers and Mechanics requiring a correct measure of great length according to U. S. Standard. Also of Tape measures for the trades, Lumbermen, Machinists, Tailors, Shoemakers, Upholsterers &c. Catalogues on application.

Steel.

HUSSEY, WELLS & CO.

MANUFACTURERS OF ALL DESCRIPTIONS OF

CAST STEEL,

INCLUDING

Best Refined Steel for Edge Tools.

PARTICULAR ATTENTION PAID TO THE MANUFACTURE OF STEEL FOR

Railroad Supplies, Homogeneous Plates

FOR LOCOMOTIVES, BOILERS AND FIRE BOXES,

Smoke-Stack Steel, Cast Steel Forgings for Crank Pins, Car Axles. &c.

ALSO, MANUFACTURERS OF THE CELEBRATED BRAND

"Hussey, Wells & Co. Cast Spring Steel,"

For Elliptic Springs for Railroad Cars & Locomotives.

PENN AVENUE and SEVENTEENTH ST., PITTSBURGH, PA.

BRANCH OFFICES:

30 Gold St., New York. 7 Hamilton St., Boston. 146 E. Lake St., Chicago.

ANDERSON & WOODS,

MANUFACTURERS OF

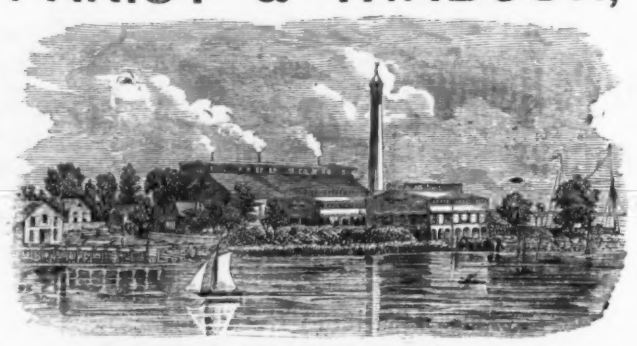
Best Refined CAST STEEL.

CAST and GERMAN PLOW and SPRING STEEL.

FIRST AVENUE AND ROSS STREET, - - - PITTSBURGH, PA.

FARIST & WINDSOR,

BRIDGEPORT, CT., 1872.



WINDSOR LOCKS, CT., 1860.

ALL DESCRIPTIONS OF

CAST STEEL

made to order for **Cutlery, Dies, Agricultural Implements. Decarbonized Steel, Frog Plates and Points, Steel Forgings to Pattern.** Quality equal to the best. Prices as low as the market admits.

JOEL FARIST. JOHN B. WINDSOR.

LABELLE STEEL WORKS.

SMITH, SUTTON & CO.,

MANUFACTURERS OF ALL KINDS OF

STEEL.

Also, Springs, Axles Rake Teeth, &c.

OFFICE & WORKS, Ridge, Lighthill & Belmont Sts., & Ohio River, Allegheny.

Post Office Address, Pittsburgh, Pa,

MIDVALE STEEL WORKS.

Works and Office, NICETOWN, PHILADELPHIA, PA.

MANUFACTURERS OF

CRUCIBLE AND OPEN HEARTH STEEL,

Steel Locomotive Tires. Steel Axles of every description.

STEEL FORGINGS UP TO 8000 lbs. IN WEIGHT.

Solid Steel Castings, Hammer Dies, Frogs, Crossings, etc.

BEST TOOL, MACHINERY AND SPRING STEELS.

WM. SELLERS, Pres. CHAS. A. BRINLEY, Supt. MARRIOTT C. SMYTH, Sec. & Treas.

CHROME STEEL COMPANY,

MANUFACTURERS OF

CHROME CAST STEEL,

WARRANTED SUPERIOR TO ANY STEEL IN THE MARKET—EITHER ENGLISH OR AMERICAN—FOR EVERY PURPOSE.

Princ'pal Office & Works, Kent Ave. and Keep St., Brooklyn, E. D., N. Y.

AGENCIES,

Kimbark Bros. & Co., Chicago, Ills.
Huntington, Hopkins & Co., San Francisco and Sacramento, Cal.
M. M. Buck & Co., St. Louis, Mo
Potter & Hoffman, Philadelphia, Pa.
Geo. Dunbar & Co., Boston, Mass.
Wood & Legrat, Hamilton, Ont.

ALBANY & RENSSELAER IRON & STEEL CO.,

Troy, N. Y.,

Office in New York City, 56 BROADWAY.

MANUFACTURERS OF

Bessemer Railway Steel,

MERCHANT BARS, TIRE AND SHAFTING,

Railroad Iron, Pig Iron, Merchant and Ship Iron,

AGENCIES IN BOSTON AND PHILADELPHIA.

Hardware.

SPEAR & JACKSON,

Sheffield, England.

MANUFACTURERS OF

Saws, Files, Edge Tools & Steel.

JOHN L. FISHER, Agent,

100 Chambers Street, NEW YORK.

JOHN WILSON'S CELEBRATED

BUTCHERS' KNIVES,
BUTCHERS' STEELS,
AND
SHOE KNIVES.

THE TRADE MARK, IN ADDITION TO THE NAME, IS STAMPED UPON EVERY ARTICLE MANUFACTURED BY

JOHN WILSON.

BUYERS ARE SPECIALLY CAUTIONED AGAINST IMITATIONS OF THE MARK, AND THE SUBSTITUTION OF COUNTERFEITS BEARING THE NAME, "WILSON," ONLY.

GRANTED A.D. 1766, BY THE CORPORATION OF CUTLERS OF SHEFFIELD, AND PROTECTED BY ACT OF PARLIAMENT.

Works:—SYCAMORE STREET, SHEFFIELD. ESTABLISHED in the Year 1750.

ALFRED FIELD & CO.,

Hardware Commission Merchants,

IMPORTERS AND EXPORTERS.

Principal Offices and Warehouses:

Birmingham, Sheffield & Liverpool, Eng.; New York, U. S.; & Montreal, Canada.

A large line of Birmingham and Sheffield goods in stock at

93 Chambers and 75 Reade Streets, NEW YORK.

HERMANN BOKER & CO.,

OFFICES AND WAREHOUSES:

NEW YORK, 101 and 103 Duane and 91 and 93 Thomas Streets.
REMSCHEID and SOLINGEN (Prussia.) H. Boker & Co.
SHEFFIELD (England), No. 3 Arundal Lane, Represented by Mr. Arthur Lee.
LIEGE (Belgium), Represented by Mr. Louis Muller.

Manufacturers and Importers of **Cutlery, Guns, Hardware** and **Railroad Material.**

Proprietors of **TRENTON VISE AND TOOL WORKS, Trenton, N. J.**—Vises, Picks, Mattocks, Grub Hoes, Sledges, Hammers, Bridge Work, Turn Tables, etc.

Proprietors of the **MANHATTAN CUTLERY CO.,** "O. K." Razors.

LAMSON & GOODNOW MFG. CO., Shelburne Falls, Mass.—Table Cutlery and Butcher Knives.

W. & S. Butcher's Files, Edge Tools and Razors, the largest stock in the United States.
Geo. Wostenholm & Son's Knives, Scissors and Razors, the largest stock in the U. S.
John Wilson's Butcher and Shoe Knives.
Peter Wright's and Armitage Anvils.

We always have on hand a full assortment of

German and English Hardware, Cutlery, Guns, Gun Material, Chains, Heavy Goods.

REED & BARTON,

Manufacturers of **FINE**

Electro-Plated Table Ware

OF EVERY DESCRIPTION,

Would invite especial attention to the great variety of new and original designs of

Dinner, Tea and Water Sets, Epergnes, Cake and Fruit Dishes, Ice Pitchers, Vases, Mantel Ornaments, &c.,

SUITABLE FOR

BRIDAL & HOLIDAY PRESENTS.

Salesroom, No. 2 Maiden Lane, New York.

Factories, Taunton, Mass.

WESTON'S

Differential Pulley Blocks

Also known as

DOYLE'S, HALL'S AND BIRD'S

are now all merged and are controlled exclusively by

THE YALE LOCK MFG. CO.,

HENRY R. TOWNE, President, Stamford, Conn.

VAN WART & McCOY, New York Agents, 134 & 136 Duane Street.

T. A. WESTON, Mechanical Engineer, with the Company.

SOMETHING NEW!

"Zero" Stove Cover Lifter.

Patented July 27th, 1875.

Made in one piece from a superior quality of sheet iron, with a perforated cylindrical handle. Its superior advantages over any other style of cover lifter are manifest, as it will not break or bend, keeps always cool, and will fit any stove cover made. Send for Circular.

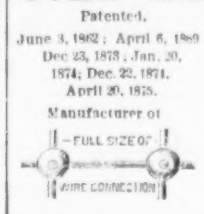
EAST RIVER SHEET METAL MFG. CO.,

SOLE MANUFACTURERS, 206 Water Street, New York

JOHN MAXHEIMER,

Patented,
June 3, 1862; April 6, 1869
Dec 23, 1873; Jan. 20, 1874; Dec. 22, 1874.
April 20, 1875.

Manufacturer of



PATENT EUREKA
Bright Metal

BIRD CAGES.

Nos. 247 & 249 Pearl Street
NEW YORK.

IVES, WOODRUFF AND CO.

MANUFACTURERS OF

Eagle Screw Clamps,

FINE

CARRIAGE MOUNTINGS

in Iron, Brass, Oroide, Steel and Gold.

SUPERIOR

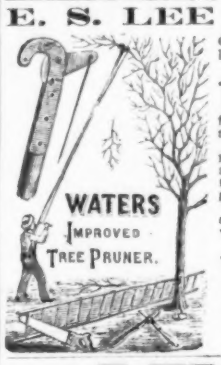
Malleable Iron

Made under the

ANDREW'S PATENT PROCESS.

Mount Carmel, - - CONN.

E. S. LEE & CO.'S



descriptive circular and price list o

WATER'S

Tree Pruner

for 1876 will be mailed to all applicants.

Extraordinary inducements offered to jobbers and the trade throughout the United States to engage in the sale of same. Light, durable, practical, cheap. All goods warranted.

Prices:

With 4 foot pole		$2 50
" 6	"	2 75
" 8	"	3 00
" 10	"	3 25

Address

E. S. LEE & CO., Rochester, N. Y.

IXL

The Woman's Friend.

The Best Finished & Most Perfect

FLAT IRON ever made.

INTERCHANGEABLE HANDLE and SHIELD COMBINED.

Patented May 4, 1875.

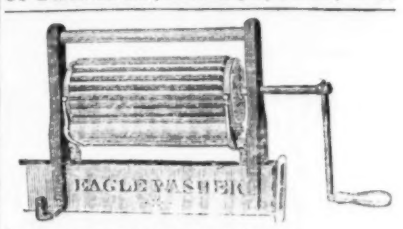
Set No. 1	—3 Irons of	5, 6 and 7 lbs.	1 Handle.. $2 00
" 2	—3 "	6, 7 and 8 lbs.	" 2 50
" 3	—3 "	7, 8 and 9 lbs.	" 2 60

Nickel Plated Irons ..... 75 cents extra.

Packed in cases of 12 sets or 36 Irons. Send for Illustrated Circular.

BROOKLYN SAD IRON CO.,

85 First Street, Brooklyn, E. D., N. Y.



The Attention of Dealers is invited to the

EAGLE WASHER.

It embodies several important new features, a very complete arrangement of parts, and is faultless in construction. Send for descriptive circular and prices to the manufacturers.

OAKLEY & KEATING,
40 Cortlandt St., N. Y

Baltimore

COMMISSION HARDWARE HOUSE

EDW'D M. KEITH,

(Late of KEITH & KELSO.)

No. 25 S. Charles Street, - - BALTIMORE

SOLE AGENT FOR

Chesapeake Nails, R. Mann's Axes,
NAYLOR & CO.'S CAST STEEL AND NAIL RODS,
And S. Loring's Tacks,
AND DEALER IN

General Hardware.

SOLICITS CONSIGNMENTS.

Clark's Patent Noiseless

Pressure Blowers and Exhaust Fans.

R. W. WILD, Agent,
20 Cortlandt St., New York

Portable and Stationary Engines, Boilers, Grist Mills, etc.

Alexander Brothers,

Manufacturers of **OAK TANNED**

LeatherBelting

410 & 412 North 3d, Philadelphia, Pa.

TWO SILVER MEDALS AWARDED

ENTERPRISE MANF'G CO. OF PA.

PHILADELPHIA,

FOR

AMERICAN COFFEE, DRUG AND SPICE MILLS.

Measuring Faucets

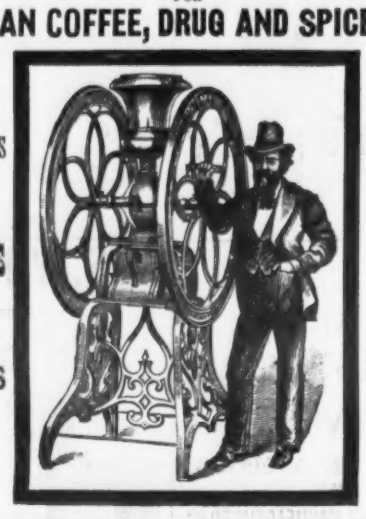
BUNG-HOLE BORERS,

TOBACCO CUTTERS

Cheese Cutters,

CORK PRESSERS

Etc., Etc.



GRAHAM & HAINES,

AGENTS,

88 Chambers St.

NEW-YORK.

NO EXTRA CHARGE FOR

NICKEL-PLATED HOPPERS WITH EAGLE DOME TOPS.

SEND FOR ILLUSTRATED CATALOGUE.

WHEELING HINGE CO.,

Wheeling, West Va.,

Manufacturers of

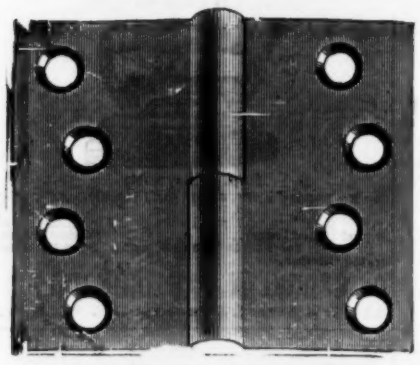
Wrought Butts, Strap & T Hinges, Wrought Hooks, Hasps & Staples, Wrought Repair Links & Washers,

GRAHAM & HAINES, Sole Agents, 88 Chambers Street, N. Y.

AMERICAN BUTT CO.,

PROVIDENCE, R. I., Manufacturers of

Cast Butt Hinges,



AND

BUILDERS'

HARDWARE.

New York Warehouse with

Messrs. GRAHAM & HAINES,

No. 88 Chambers Street.

Send for Price List.

All kinds of

SMALL CASTINGS

Made to order.

QUACKENBUSH, TOWNSEND & CO.,

Hardware, Cutlery, &c.

85 Chambers & 67 Reade Sts., N. Y.

Depot for

THOS. JOWITT & SONS,

(Sheffield, England,)

FILES and HORSE RASPS.

Rough & Ready

And

CLIPPER SCYTHES,

Warranted.

Manufacturers of the

CHALLENGE DOOR & GATE SPRING.

Patented March 4, 1873.

Agents for

Norwich Lock MFG. CO.

"BEAVER"

(American)

FILES and HORSE RASPS.

"WIDE AWAKE"

AXES.

Baltimore STEEL HOE Works.

O. H. HICKS & CO.

Manufacturers of the

Lockwood Hoe,

Send for Sample and Price List.

BALTIMORE, MD.

G. W. Bradley's Edge Tools.

Butchers' Cleavers,
Butchers' Choppers,
Axes and Hatchets,
Grub Hoe and Mattocks,
Mill Picks
Box Chisels and Scrapers,
Ring Bush Hooks,
Axe Eye Bush Hooks,
Socket Bush Hooks,
Watt's Ship Carpenters' Tools,
Carpenters' Drawing Knives,
Coopers' and Turpentine Tools.

FOR SALE BY

N. WEED, 4 & 6 Gold St., N. Y.

SAMUEL LORING'S

PLYMOUTH TACK AND RIVET WORKS

PLYMOUTH, MASS., manufacturer of

TACKS, BRADS, NAILS AND

RIVETS.

Swedes and Common Iron Tacks; Leathered, Carpet Brush, Lace and Gimp Tacks; Finishing, Hungarian, 2d 3d and 8d Fine, Trunk, Clout, and Cigar Box Nails; Black and Tinned Trunk Nails; Zinc, Iron, Copper and Steel Shoe Nails; Brads and Patent Brads; Glaziers' Points &c., &c., &c., COPPER, BRASS AND IRON RIVETS, of all kinds. Coopers' Rivets, from 1d to 6d, in casks of 100 lbs. each. Hose, Belt and Shoe Rivets and Burs. Oval and Countersunk Heads of extra lengths, made to order. SHIP AND BOILER RIVETS OF ALL SIZES AND LENGTHS

COBB & DREW,

Plymouth, Mass.

Manufacturers of Copper, Brass, and Iron Rivets: Common and Swedes Iron, Leathered, Carpet, Lace and Gimp Tacks; Finishing, Hungarian, Trunk Clout and Cigar Box Nails, &c. Rivets made to Order.

NEW YORK AGENCY

Grundy & Kenworthy

HARDWARE.

165 Greenwich Street.

Agent for the Philadelphia Star Carriage and Tire Bolts

Established in 1836.

Shelton Company,

Manufacturers of every variety of

TACKS & SMALL NAILS,

Carriage, Machine, Plow, Stove and Tire Bolts, Coach Screws, Bed Screws, &c.

BIRMINGHAM. CONN

JAS. FALLOWS & CO.,

MANUFACTURERS AND PATENTEES

Tin Toys, Stationery Goods, &c.

Rear of 51 and 53 North Third Street, PHILADELPHIA.

PAPIER MACHE TOYS, STAMPING & JAPANNING A SPECIALTY.

It is the most convenient durable, safe and reliable Snap ever used. It is easily operated with glove or mitten on. It has a brass coil spring that is four times as long as any other coil spring snap, which will neither rust nor be affected by cold, like steel springs in common use. It is enclosed in the barrel back of the bolt, making a snap which works freely under all circumstances, and without danger of having its parts broken or disarranged. We manufacture all sizes of Harness Snaps and Round Eye Snaps, and Covert's Patent Thimble to go on rope for Cattle and Horse Ties. Also other goods.

Send for price list and circulars.

HOLD BACK & SNAP CO., Troy, N.Y.

Established in 1839.

A. G. COES & CO.

WORCESTER,

Mass.,

Manufacturers of

THE GENUINE

COES'

SCREW WRENCHES.

Our goods have been very much improved recently, by making the *Bar WIDE*, as shown in the cut, which makes a 12 in. Wrench as strong as a 15 in. made in the ordinary way, and by using

A. G. COES'

NEW PATENT

FERRULE

Which cannot be forced back into the handle

☞ Our goods are manufactured under Patents dated February 7, 1860, (re-issued June 29, 1871), May 2, 1871, and Dec. 26, 1871, and any violation of either will be *vigorously prosecuted.*

We call particular attention to our new Patent Ferrule, with its Supporting Nut (shown in section in the above cut), which makes the strongest Ferrule fastening known.

A. G. COES & CO.

TUCKER & DORSEY,

MANUFACTURERS.

Indianapolis, Ind.

The Hart, Bliven & Mead Mfg. Co.,

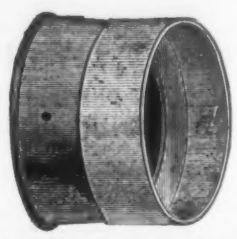
18 & 20 Cliff Street, and 243 & 245 Pearl Street, New York.

Factories at KENSINGTON, CONN.

MANUFACTURERS OF

CARRIAGE HARDWARE.

Send for Our New Catalogue and Price List.



Every style of Bands & Sockets in Silver, Nickel, Oroide & Gold Plated.

Lloyd, Supplee & Walton,

HARDWARE FACTORS.

MANUFACTURERS OF

Bonney's Hollow AUGERS.

Stearn's Hollow Augers and Saw Vises

Bonney's Spoke Trimmers

Double Edge Spoke Shaves

Adjustable Gate Hinges

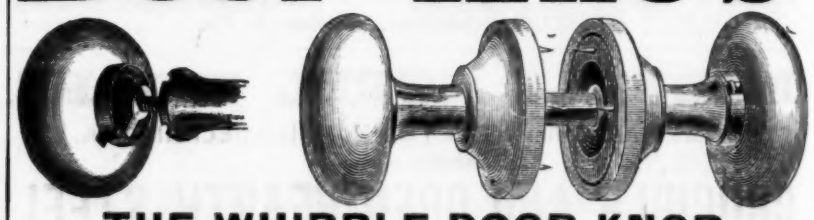
Scandinavian Pad Locks

Flat Key Brass and Iron Pad Locks, &c., &c.

625 Market St., Phila., Pa.

WHIPPLE'S PATENT

Door Knob



THE WHIPPLE DOOR KNOB

Is the only perfect Door Knob Attachment ever invented.

AWARDED A BRONZE MEDAL

At the American Institute Fair, in New York, for 1874.

NO SCREWS USED IN NECK OR ROSES.

Adjusts Perfectly to Doors of Different Thicknesses

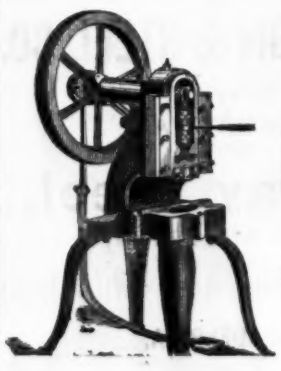
WITHOUT THE USE OF RINGS.

The attention of Architects, Builders and Carpenters is specially desired. Circulars fully describing the advantages of this Knob, with Price List, sent on application to

The Parker & Whipple Co.,

WEST MERIDEN, CONN.,

Or 97 CHAMBERS STREET NEW YORK.



A. H. MERRIMAN,

Patent Power

Punching Presses.

Patentee and Sole Manufacturer.

I warrant every part of this Machine to stand the shock of the wheel running at 125 revolutions.

West Meriden, Conn.

PHILADELPHIA.

(Corrected weekly by Lloyd, Supplee & Walton).

Terms, 30 days. For 60 or 90 days, interest added at 10 per cent. per annum.

Anvils.—Solid Cast Steel.....₱ ℔ 14c
Peter Wright's, ₱ ℔, gold.....11½c
Williamson s " " " .....11 c
Eagle.....just ½ cents—dis 20 @ 20&10 %
Apple Parers.—Victor.....per doz $7 75
Domestic.....“ 7 75
Reading.....“ 7 75
Bay State Paring, Coring and Slicing.....“ 15 00
“ “ Peach Parers.....“ 10 50
10 doz. lots 50c. per dozen discount.
Axes.—
Mann s (according to weights)..Per doz. $11 50 @ 10 00
Red Indian. “ “ “ “ 11 50 @ 10 50
Red Chiefrain, “ “ “ “ 12 00 @ 11 00
Crown Prince “ “ “ “ 12 00 @ 11 50
Hunt's “ “ “ “ 12 50 @ 11 50
Augers and Auger Bits.—
Benjamin Pierce.....dis 35 %
Douglass' & Ives' Bits.....dis 40&5 %
Connecticut Valley Auger Bits.....dis 40&5 %
Cook s Bit.....dis 40&10 %
Jennings' Bits.....dis 10 %
Bates' Nut Augers.....dis 40&5 %
Douglass' & Ives' Augers.....dis 40&5 %
Watrous' Ship Augers.....dis 15 %
Bonney's Pat. Hollow Augers.....dis 25 %
Stearns' Patent Hollow Augers.....dis 25 %
Balances.—
Landers, Frary & Clark's.....} Sold on Morton's new
Morton's.....} List.....dis 50 %
Chattillon's.....}
Common Spring with Hook.....₱ doz $1 38 @ 2 00
Bells.—bevin Bros. Mfg Co. Light Hand Bells.....dis 70 %
Common (Tissue Paper Weight).....dis 70&10 %
Swiss Pattern Hand Bells.....dis 50 %
Connell's Door Bells.....dis 50&5 @ 50&10 %
Gt. Western & Kentucky Cow.. dis 50&10 @ 50 10&5 %
Boring Machines.—Bates' Mfg. Co., complete with augers.....dis 20 @ 25 %
Douglas Mfg. Co., complete with augers..dis 20 @ 25 %
Common Boring Machines, no Augers.....$4 00 @ 8 75
Angular “ “ “ .....5 00 @ 4 75
Bolts.—Eastern Carriage Bolts.....dis 75 %
Western “ “ “ .....dis 75 %
Philadelphia “ “ “ .....dis 60&10 %
“ Eagle, (Coleman's).....dis 60&10 %
Wrought Snutter, Stanley.....dis 50 @ 50&10 %
Braces.—Barber s.....dis 40&5 %
Backus.....dis50 %
Bartholomew s American Ball.....dis 10&10 @ 15&10 %
Spofford.....dis 50 %
Butts.—Cast Fast Joint, Narrow.....dis 25&10 @ 30&10 %
“ “ Broad.....dis 35&10 @ 40&10 %
Cast Fast Loose Joint.....dis 45&10 @ 50&10 %
“ Acorn, Loose Pin.....dis 4 0&10 @ 45&10 %
“ Mayers & Parliament.....dis 35&10 @ 40&10 %
“ Acorn Jap'd.....dis 45&10 @ 50&10 %
Wrought Loose Pin.....dis 35 %
“ Table Hinges and Back Flaps.....dis 30 %
“ Narrow.....dis 30 %
“ Loose Joint.....dis 35 %
Parker's Bling Butts.....} Discount 65 %; by the case
Buffalo Haw. Co. “ “ “ .....} 65&10%.
Clark's “ “ “ .....}
Shepard “ “ “ .....}
Lull & Porter's (Phila.) Hinges....dis 60 %; case, 60&5 %
Garretson's No. 0 Hinges.....} 65&10 %
Cherrytree No. 0 “ “ .....}
Chains.—German Halter.....dis 20 %
“ Coil.....dis 20 %
Galvanized Pump.....net 13 @ 13½c
Best Proof Coil Chain—

₱ ℔	12½	9½	8¼	8½	8	7¾	7c gold
	5-16	⅜	7-16	½	⅝	¾ in.	

By the cask, 500 lbs., ½c per lb. less Common Chain, ¾c per lb. less.
Chisels.—Socket Framing.....dis 60 @ 60&10 %
Socket Firmer.....dis 60 @ 60&10 %
Tang “ “ “ .....dis 40&10 @ 50 %
Beavy s Framing and Firmer.....dis 2 %
Casters.—Iron Bed.....dis 30&10 @ 40 %
Porcelain Wheel Bed.....dis 40&10 @ 50 %
Iron and Brass Wheel Plate.....dis 40 @ 10&10 %
Porcelain Wheel “ “ .....dis 50 @ 50&10 %
Clothes Wringers.—Universal.....per doz $12 00
Novelty.....“ 7 2 00
Discount on 2 dozen lots, $2 per dozen.
Coffee Mills.—Common Box and Side.....dis 15 %
Patent Box and Side.....dis 15 %
Cutlery.—American Pocket (best).....dis 25 %
Landers, Frary & Clark, J. Russell & Co. and Lamson & Goodnow Mfg. Co. Manufacturers' net prices.
Drawing Knives.—Hart Mfg. Co. s.....dis 60 %
Adjustable Handle.....dis 10 @ 15 %
Beatty.....dis 15 @ 20 %
Fry Pans.
Tinned.....dis 40 @ 45 %

₱ doz.	$3 50	4 00	4 50	5 00	5 50	6 50	7 50	9 00	10 00
No.	0	1	2	3	4	5	6	7	8

Burnished.....dis 40 @ 45 %

₱ doz.	$3 00	3 75	4 25	4 75	5 25	6 00	7 00	8 00	9 00
No.	0	1	2	3	4	5	6	7	8

Files.
Nicholson Mill Files.....new list
“ Bastard.....“
“ Taper.....“
Butcher's Mill.....$4 75 to £ gold
“ Bastard.....4 75 to £ gold
“ Taper.....4 75 to £ gold
Fluting Machines.
R. F. M.—4 in. rolls.....$4 00 net
“ —6 in. rolls.....4 25 net
Mrs Knox—4 in. rolls.....4 25 net
“ —6 in. rolls.....4 50 net
Improved—4½ in. rolls.....4 00 net
“ —6 in. rolls.....4 25 net
Hammers.
Yerkes & Plumb's.....dis 15 @ 20 %
Hammond & Son's.....dis 15 @ 20 %
Yerkes.....dis 20 @ 25 %
Hatchets.
Beatty's.....dis 25 %

Shingling and Half.	₱ doz.	$7 00	7 50	7 75	8 00
	No.	1	2	3	

Yerkes & Plumb.....dis 15 @ 20 %

Shingling and Half.	₱ doz.	$7 00	7 50	8 00	8 50
	No.	1	2	3	4
Claw	₱ doz.	$7 50	8 00		
	No.	1	2		3

Hinges.
Strap and T.....dis 50&10 %
Horse Nails.

Nos.	6	7	8	9	10
Ausable	27	25	24	23	22
Globe	28	26	25	24	23
Brundage	26	24	23	22	21
Nos.	5	6	7	8	9
Putnam	32	28	26	25	24

On Ausable, Globe and Brundage 1000 ℔ lots.....dis 5 %
Knobs.—Door, Mortise and Rim.
Makes in Combination.....new list dis 45&5 %
Extra discount for cash 2 %
Mineral and Rim.....dis 5 %
Locks and Latches.—Rim and Mortise.....dis 40&5 %
Extra discount for cash 2 %
Till and Cupboard.....dis 25 %
American Padlocks.....dis 50 %
Extra discount for cash 2 %
Scandinavian Pad Locks.

₱ doz.	$10 50	10 50	12 00	12 00	15 00	15 00	dis 40 %
No.	59	59½	60	60½	61	61½	
₱ doz.	$12 00		18 00		24 00	22 00	dis 40 %
No.	63		62½		63	63½	

Trunk Locks.....dis 5 @ 10 %
Thumb and Roggens Latches.....dis 25 %
Lanterns.—Square Candle and Oil.....dis 10 %
Globe for Oil.....dis 10 %
“ “ Kerosene.....dis 10 %
Tubular Lanterns.....dis 10 %
Mattocks.—Long and Short Cutter.....dis 25 %
Western Pattern.....dis 25 %
Pennsylvania Pattern.....dis 15 %
Molasses Gates.
Enterprise Mfg. Co.'s Measuring Faucets.....dis 20 %
Stebbins' Gates.....dis 62½ @ 62½&10 %
Lincoln s “ .....dis 40&10 @ 50 %
Landers, Frary & Clark's Petroleum.....dis 15&10 %
Taylor's Petroleum Faucets.....dis 20&10 %
Brass Liquor Cocks.....dis 20&10 %
Meat Cutters.—Dixon's.....dis 20 %
Woodruff.....dis 20 %
Stowe.....dis 20 %
Hale's.....dis 35 %
Stuffers.....dis 30 %
Pianos.—Auburn Tool Co., “Bench”.....dis 40 %
Second Quality.....dis 50 %
Metallic Piane Co.....dis 25&5 %
Evans Pat. Circular.....net
Plumbs and Levels.
Adjustable.....dis 60&10 %
Non-Adjustable.....dis 60&10 %
Plane Irons.—American.....list net
Butcher's.....gold £, $5 50
Picks—Philadelphia.....net
Pittsburgh.....net
Rules.....dis 60&10 %
Rakes.—Cast Steel Garden.....dis 40 @ 40&5 %
Malleable Garden.....dis 40 @ 40&5 %
Wood Head Iron Teeth.....dis 40 %
Steelyards.—American Pattern.....dis 15 %

₱ doz.	$5 50	7 00	9 00	10 00	11 00	12 00
No.	50	100	150	200	250	300

English Pattern.....dis 15 %

₱ doz.	$7 00	9 67	10 67	12 67	14 67	16 67
No.	50	100	150	200	250	300

Hart's Pattern.....dis 50 %

₱ doz.	$14 00	17 75	21 00	26 50	31 50	36 50
No.	50	100	150	200	250	300

Scythes.—Golden Clipper, Damascus Blade, Boxed and Sharpened.....₱ doz. $10 00
Clipper No. 10, Brass Blade Boxed and Sharpened.....₱ doz. $9 50
Clipper No. 5, Painted Red, Boxed and Sharpened.....₱ doz $9 00
Cast Steel Scythes.....$7 50 @ 8 00
German “ “ .....8 50 @ 7 00
Squares.—Steel and Iron, new list.....dis 50 %
Saws.—Diston's Cross Cut.....dis 15 %
Diston's Hand.....dis 15 %
W. McNiece s Hd. Cross-Cut & Circ'r, new list..dis 15 %
Boynton's Lightning, new list.....dis 40 %
“ Champion.....dis 45 %
Shovels and Spades.
Rowland's Plain Back, Changed Jan. 14, '76...dis 33⅓ %
“ Back Strap “ “ “ ...dis 35⅓ %
Oliver Ames & Sons.....dis 20 %
Brady Shovel Co.....dis 30&5 %
Sad Irons.—Richmond (polished face).....per lb. 3½c
Richmond (polished face).....by the cask “ 3¼c
Stone.—Arkansas Oil, No. 1.....₱ ℔ 8 “
Turkey Oil, No. 1.....“ “
Wassita Extra.....net “ 9½c
“ No. 1.....net “ 80c
“ “ 2.....net “ 85c
“ “ 3.....“ 8½c

Screws.
United States and others in Combination.....dis 40 %
Keystone, not in Combination.....dis 40&5 %
Spoons.—
Plated.....dis 40&10 @ 50 %
Britannia, Boardmans (new list).....dis 50&10 %
“ Parkers (old list).....dis 50 @ 50&10 %
German Silver.....dis 30 %
“ Light.....new list dis 35 %
Lalance & Grosjean Iron.....dis 50 %
Springs.—Gray's Door.....dis 60&10 %
Torry's Door.....dis 60&10 %
Stocks and Dies......dis 10&5 %
Stove Polish.—Gem.....₱ gross, $5 00
Onyx.....“ $5 00
Try Squares.—Winterbottom.....dis 10 @ 15 %
Stanley Rule and Level Co.....dis 45&10 %
Willis Thrall, No. 2.....dis 30&10 %
Disston's No. 2.....dis 40 %
Tacks, &c.—Half Weight Tacks.....dis 75 @ 75&10 %
“ “ by the case...dis 72½&7½ %
Trunk, Clout and Finishing Nails.....net to 10 %
“ “ by the case.....dis 7½ %
Traps.—Genuine Oneida—Newhouse list.....dis 20 %
Imitation “ “ “ .....dis 30 @ 35 %
Vises.—Solid Box, currency.....₱ ℔ 13½c
Wrenches.—Coes Genuine.....dis 40&5 @ 40&10 %
Coes Imitation Wrought Bar.....dis 50&50&10 %
“ “ Malleable Bar.....dis 60&10 %
“ “ (Kellogg) Malleable Bar.....dis 65&10 %
Tafts Pattern (Wrought Bar).....dis 70 @ 70&10 %
Philadelphia Tool Co.'s Pat. Duplex.....dis 25 %
“ “ “ Improved Baxter.....dis 25 %
“ “ “ Adjustable Fork.....dis 25 %
Wire.—No. 0 to 18.....(Advanced April 24th)..dis 47½ %
No. 19 to 26.....“ “ “ .....dis 50 %
No. 27 to 36.....“ “ “ .....dis 52½ %
Coppered 0 to 12.....“ “ “ .....dis 15 @ 30 %
Tinned Broom Wire.....dis 35 %
Galvanized Wire No. 1 to 18.....dis 40 %

BUFFALO.

Reported by Messrs. Sidney Shepard & Co.
November 6, 1875.

Augers—Snell Mfg. Co.....dis 25 %
Axes—Francis.....11 50
Bits, Auger—Snell Mfg. Co.....dis 25 %
“ Phœnix.....dis 40 %
Bells, Cow—Saw s Genuine.....dis 25 %
Braces—Bit, Spofford's Patent.....dis 50 %
Brads, Cut.....dis 50&7½ %
Boards—Stove, Brooks' Pat..dis 85 % 4 mos.; 35&5 % 30 dys
Belting—Rubber.....dis 30 @ 10 %
Leather, new list, oak tanned.....dis 20 %
Brick—Bath (box of 2 doz) Best English.....$1 25
“ Retherford.....$1 00
Can Openers—Sprague's.....dis 50 %
Cases—Parlor Coal Hod.....dis 15 %
Chalk—White, Carpenter s.....₱ gross, 57c
Red, Carpenter's.....“ 90c
Chisels—Firmer Socket.....dis 60, 10&10 %
Framing Socket.....dis 60, 10&10 %
Corner Socket Chisels.....dis 60, 10&10 %
Slick's Carpenters'.....dis 60, 10&10 %
Castings—Malleable.....₱ ℔ 9½c
Cutters—Meat, “Holes”.....35 %
Egg Beaters—“Peerless”.....per doz $2 60
“ Centripetal”.....per doz 5 00
Elbows—Corrugated.....dis 10 %
Adjustable.....dis 20 %
Files—Maischoss Bros.....dis 50 %
Fluters—Geneva Hand.....₱ doz. $15 00
Freezers Ice Cream—“ Champion.....dis 33⅓ %
Hammers—Henry W. Kip's.....dis 12 %
Hinges, Gate—Shepard's.....dis 30&10 %
Hinges—Window Blind—
Sheppard s and Standard.....dis 60, 10&5 %
Hods, Coal—Plain, Black and Galvan'd...new list dis 15 %
Funnel, Black and Galvanized.....“ dis 15 %
Fancy and Helmet.....“ dis 15 %
Sad Irons.....dis 15 %
Kettles—Brass.....33½c
Copper, “Hand Made”.....₱ ℔ 45c
Enameled.....38c. @ 40c.
Knives, Drawing—Oval No. 1.....dis 50&10 %
Razor Blade.....dis 60&10 %
Lanterns “Peerless,” ...No. 1 8 10
₱ doz $36 00 $10 50 $13 75 dis 10 %
Tubular.....$11 00
“ with Guards.....11 50
Machines—Apple Paring, “Keystone”.....7 75 ₱ doz
Machines—Boring, Snell's.....dis 20 %
Mills, Coffee—Box and side, common.....dis 15 %
Box Union and Eagle.....dis 15 %
“ American.....dis 20 %
Molasses Gates—“Self Measuring”.....dis 20 %
Nails—Clout and Finishing.....dis 7½ %
Shoe.....dis 7½ %
Cut, “Chesapeake,” 10d.....$3 10
Horse, Ausable.....No. 5 7 8 9 10
30 27 25 24 23 22c
“ “ Pointed & Polished.....add 1c ₱ ℔
“ “ 1000 lbs.
“ Clinton.....No. 6 7 8 9 10
21 19 18 17 16c
Packing—Rubber.....dis 30 @ 10 %
Paint—White Lead, U. S. Gov't.....₱ ℔ 8½c
Pans—Dripping.....₱ ℔ 10c
Rivets—Iron, Black and Tinned.....dis 25&7½ %
Screws—“American Screw Co”—
Flat Head, Iron.....dis 80%
Flat Head, Brass.....dis 30 %
Sieves—Wood, Hoop Iron.....$1 35
Tinned.....1 75
Skates and Straps—White's.....dis 30 %
Spoons, Iron Tinned.....dis 10 %
“ by the case.....dis 20 %
Plated Rogers' A No. 1.....dis 50 %
Britannia.....dis 50&10 %
G. S. Hall, Elton & Co.....dis 50&5 %
Squares—Steel and Iron.....new list 50 %
Scales—Buffalo Scale Works.....dis 25 %
Fairbanks.....dis 15 %
Stove Polish—Gem.....₱ gross, $4 50
“ Dixon's.....“ 8 00
Tacks—Half Weight Am. Iron.....dis 72½&7½ %
Tea Trays.....dis. 15 %
Tools—Machinists' and Tinmens'.....dis 10 %
Vases—Palace Coal.....dis 15 %
Vises—
Parallel, Buffalo...Old pattern, dis. 80 %; new, do..dis 20 %
Ware—French, Tinned and Iron.....dis 20&10 %
Stamped and Japanned.....dis 10 %
Cast Iron Hollow.....dis 40 %
Wire—Bessemer Steel.....dis 10 %
Tin Plates.—Add for each X.....2 50
10x14, IC. Charcoal...$9 50 | 14x20 C. terne.....$8 75
12x12. “ ...10 00 | 20x28 C. “ 19 50
12½x17, “ ...9 00 | 20x28 X. “ 24 00
14x20. “ ...10 50 |
Pig Tin—Straits.....35c @ 26c
Bar Tin.....27c
Solder—No. 1, Crook's.....16 c
Sheet Zinc—
“ Lasalle”.....$7 00 | 100 ℔ casks
$10 50 | 10 00 ₱ 100 ℔s
Sheets.....$10 50
Babbitt Metal.....₱ ℔ 12c
Iron Wire—Bright and Annealed.....dis 45 %
Coppered.....dis 40 %
Tinned.....dis 25 %
Tinned Broom, { Nos. 30 | 21 | 22 | } dis 35 %
{ 20c | 21c | 21c | }
Copper—Sheathing 14 @ 18 oz.....₱ ℔ 30c
Planished.....₱ ℔ 37c @ 39c
Bottoms.....“ ℔ 32c
Bolts.....₱ ℔ 31 @ 33c
Braziers' Sheets.....₱ ℔ 31 @ 33c
Sheet Iron.—
18 Common.....$4 05
24 Common.....4 25
26 Common.....4 45
24 W. D. Wood & Co., Smooth Finish.....5 25
Planished.....A. B.
14c 11c
Gen. Russia, No. 1 stained.....$11 00
“ “ clean.....15c
Galvanized.....dis 33⅓ %

CINCINNATI.

Reported by Sellew & Co., Importers and Jobbers Metals, No. 214, 216 and 218 Main street.
November 1, 1875.

Tin Plate.—I. C. 10x14 Charcoal.....$9 50 @ 10 00
I. X. 10x14 Charcoal.....12 00 @ 12 50
I. C. Terne 14x20.....8 45 @ 9 25
I. C. Terne 20x28.....20 50 @ 21 00
I. C. 20 inches Continuous.....21 00
Block Tin.—
Pig.....₱ ℔ 25c
Bars.....“ ℔ 26c
Solder.—
A 1.....₱ ℔ 16c
Roofing.....“ ℔ 17c
S. & Co.....“ ℔ 19c
Lead.—Pig.....“ ℔ 7¼c.
Bar.....“ ℔ 8¼c
Copper.—
Ingot.....₱ ℔ @ 24c
Planished.....“ @ 38c
Sheathing.....“ @ 31c
Copper Drops.....“ @ 34c
Sheets, 8 to 7 lb.....“ @ 37c
“ 8 to 9 lb.....“ @ 35c
“ 10 to 12 oz.....“ @ 33c
“ 13 lb. up.....“ @ 31c
Copper Bottoms.....“ @ 33c
Zinc. Casq, 500 to 1000 lbs.....₱ ℔ 10¼ @ 10¾c
Case, 100 lbs.....“ 10¾ @ 11 c
Slab.....“ 7½c
Brass.—Roll, No. 6 to 20.....₱ ℔ 30c
Roll, No. 20 to 28.....“ 35c
Wire, No. 6 to 20.....“ 35c
“ 20 to 25.....“ 40c
Babbit Metal.—Sellew & Co.....“ 35c
Aliens'.....“ 40c
Market.....“ 12c
Antimony.....₱ ℔ 17c
Bismuth.....₱ ℔ $4 00
Nickel.....₱ ℔ $3 50
Russia Iron.—Bundle.....₱ ℔ 16c
Less than bundle.....₱ ℔ 18c
No. Stained.....₱ ℔ 15c @ 16c

Sheet Iron.	Com. B.	Smooth Fin. S. L. U.	Smooth D Re'd.
15 to 20	4c	5 10c	7 10
22 to 24	4 30c	5 80c	6 90
26	4c	5 80c	7 05
27	4 30c	5 ¼c	7¼
30	¼c		

Galvanized Iron.—Full bundles.....dis 30 %
Nos. 18 to 20.....74c | No. 26.....14c
22 to 24.....13c | 27.....15c
Bar Steel.—Silver, ₱ ℔ 16c Crescent, 21c.....dis 35 %
Iron Wire.....dis 30 %
Enameled Ware.....dis 30 %

One Piece Corrugated Elbows.....dis 10 %

Charcoal Iron.		Russia Iron.	
4½ inch	₱ doz $2 50	4½ inch	₱ doz $5 00
5 “	3 50	5 “	7 00
5½ “	4 50	5½ “	7 50
6 “	5 25	6 “	12 00
7 “	6 50	7 “	14 00

Leader Elbows, Flat Crimp Retinned or Galvanized.—Dis. 10 %

	₱ doz.		₱ doz.
2-inch	$1 75	2½-inch	$2 75
3-inch	2 25	3½-inch	3 25
4-inch	2 50	4½-inch	3 50

Sheet Iron Bread Pans.....₱ ℔ 8½c
American Broilers.....₱ doz. 4&5 50
Tinmen's Machines.....dis 5 %
Sad Irons.—I X L s.....₱ ℔ 8½c
Brass Kettles.—Anaconda.....43c
Dog Irons.....9 c

PITTSBURGH.

The following are the Card rates of Lewis, Oliver & Phillips, H. B. Newhall, 11 Warren St., New York, Agent.
Iron, standard list assorted sizes, for large orders, specifications to include Bands, small Rounds and Ovals, 75c. rate, 2 % off net.
Flat Rail (1½x¼), punched and coun'sunk..4 1c ₱ ℔ net
Iron Wedges.....4½c ₱ ℔ net
Norway Nail Rods.....8 ¼c ₱ ℔ net
Crow Bars (in ordering please state whether “Wedge” or “Pinch” point).....4¾c ₱ ℔ net
Beetle Rings.....8 c ₱ ℔ net
Fence Pickets—
⅝ round, bent to shape, 25c ₱ ft. of fence, less 15 % off net.
Discount off Standard List.
Carriage and Tire Bolts.....75 % off net
Carriage and Tire Bolts delivered on cars or boats in Pittsburgh.....
Stove Bolts.....20 % off net
Machine and Square Head Bolts.....40&10 % off net
Coach and Lag Screws.....40&10 % off net
Bolt Ends.....40 % off net
Pat. Hot Pressed Square and Hexagon Nuts, small sizes, from 3-16 to ⅝ in.....8¼c ₱ ℔ off net
Pat. Hot Pressed Square and Hexagon Nuts, large sizes, from 7-16 to 2 in.....6¾c ₱ ℔ off net
Washers, all made from new band iron, small sizes, from 3-16 to ⅝ in.....9¼c ₱ ℔ off net
Washers, all made from new band iron, large sizes, from 7-16 to 1⅝ in.....7¾c ₱ ℔ off net
Nuts and Washers in 25 lb. boxes, ¼c ₱ ℔ ex. Nuts and Washers in lots less than one keg each size, ½c ₱ ℔ ex. Nuts and Washers in 5 lb. boxes, 1c. ₱ ℔ ex. net prices.
Standard Caps, for Plows.....5¼c. ₱ ℔ net
Iron Harrow Teeth, in lots of 1 ton or more, packed in 200 lb. boxes, 1 in. diam. 3¼c ₱ ℔ net; ¾. ⅞ in. diam. 3½c ₱ ℔ net; ⅞ in. diam. 3¾c ₱ ℔ net.
Patent Headed Harrow Teeth, packed in boxes ½c ₱ ℔ ex
Skein Bolts, in bulk, in lots of 1 keg or more, ⅝ in. diam. 5c ₱ ℔ net; 9-16 in. diam. 6c ₱ ℔ net; ⅝ in. diam. 7c ₱ ℔ net. 1c ₱ ℔ extra when less than 1 keg of each size is ordered.
Strap & T Hinges...33⅓&10 % off net, delivery as custo'ry
Screw Hitching Rings.....$5 25 ₱ 100 net
Bridge and Roof Bolts—
1 to 2 in. diam. over 8 ft. long.....₱ ℔ 3¾c net
1 to 2 in. diam. from 4 to 8 ft. long.....“ 4 c net
1 to 2 in. diam. from 1⅝ to 4 ft. long.....“ 4¼c net
⅝, ¾ and ⅞ in. diam. over 4 ft. long.....“ 4½c net
⅝, ¾ and ⅞ in. diam. from 1⅝ to 4 ft. long.....“ 5 c net
Bridge bolts with upset ends.....¼c. ₱ ℔ extra
Wrought iron plates, punched.....4¼c. ₱ ℔ net
Cast Iron Washers.....₱ ℔ 3¼c net
Duck Nest Tuyere Irons.....$14 50 ₱ doz net

WAGON HARDWARE.

Wagon Box Strap Bolts—

10 in. long by 7-16 at Screw End, ₱ set of 8 bolts..							45c
12	“	½	“	“	8	“	55c
10	“	9-16	“	“	8	“	65c
12	“	9-16	“	“	8	“	70c
14	“	9-16	“	“	8	“	90c
10	“	⅝	“	“	8	“	80c
12	“	⅝	“	“	8	“	80c
14	“	⅝	“	“	8	“	90c
16	“	⅝	“	“	8	“	1 00
18	“	⅝	“	“	8	“	1 10
20	“	⅝	“	“	8	“	1 20

5c ₱ set for each additional inch over 14 in All lengths made.
In ordering Box Strap Bolts please give diameter at Screw End.
Wagon Box Rods, narrow track, each.....15c
“ “ wide track, each.....17c
Single Tree Irons, ₱ set of four pieces.....30c
Wrought Iron Bolster Plates, 2¾ in. wide, ₱ set.....45c
“ “ “ 3 “ “ “ 50c
“ “ “ 3¼ “ “ “ 55c
“ “ “ 3½ “ “ “ 60c
Wagon Brake Ratchets, each.....14 c
“ “ “ finished with guard, each..40 c
Wrought Hammer Straps, heavy pattern, each.....13 c
“ “ “ light “ each.....12 c
“ Rub Irons, each.....9 c
Stay Chain Hooks, each.....5¼c
Double and Single Tree Clips, figure 1, each.....8 c
“ “ “ 2, each.....9 c
“ “ “ 3, each.....11 c
Axle Clips, Round Part ⅝, Flat Part 1¼, each.....8c
Wagon Clevis, including Pin, complete, each.....10c
Pole Caps, each.....24c
Single Tree Hooks, Nos. 1 and 2.....4½c
Strap Bolts, Rods, Single Tree Irons, Bolster Plates, Brake Ratchets, Hammer Straps, Rub Irons, Stay Chain Hooks, Clevis and Pin, Clips, Single Tree Hooks, and Pole Caps, in lots of 50 sets.....dis 15 %
Wagon Box Staples, 1¾ to 2¼ in. to clinch. ₱ 1000 $11 00 net
“ “ “ Bevel Box Iron, to rivet on. ₱ 1000 7 50 net
Neck Yoke Eyes, each.....4¼c net
“ “ with ¾ rings, each.....7¼c net
King Bolts, ¾, 1, 1¼, and 1¼ in. diam.....₱ ℔ 4¼c net
Wagon Rivets, ex. large, flat, oval and steeple head, ¼ in. diam. all lengths.....“ 8½c net
Wagon Rivets, 3-16 in. diam., all lengths.....“ 9¼c net
“ ¼ to 1 inch long.....₱ ℔ 1c extra
“ & Nails, in 5 ℔ paper boxes.....“ 1c extra
“ in 25 ℔ wood “ .....“ ¼c extra
Wagon and Hinge Nails, ¼ in.....₱ ℔ 17 c net
“ “ “ 5-16 in.....“ 19 c net
Wagon Rivets and Nails, in less lots than one keg each size.....“ ¼c extra
Double Tree Plates.....“ 5c net
Coupling “ .....“ 5c net
Tongue “ .....“ 8½c net
Neck Yoke Plates.....“ 10½c net
Tongue Cap Iron, 1¾, 2 & 2¼ in. wide, same price ₱ ℔ as Band Iron.
Wagon Chains, Stay, Lock and Tongue, 5-16 in, ₱ ℔ 10½c net. ¼ in., 11½c. net
Above prices are free on board cars in Pittsburgh. Subject to change of market, without notice.

DETROIT.

(Reported by Messrs. Jewett & Root.)
Nov. 8, 1875.

Tin Plate.—Best Charcoal
IC, 10x14.....$ 9 75
IX, 10x14.....12 25
XX, 10x14.....14 75
IC, 12x12.....10 25
IX, 12x12.....12 75
IC, 14x20.....10 75
IX, 14x20.....13 25
XX, 14x20.....15 75
XXX, 14x20.....18 25
XXXX, 14x20.....20 75
DC, 100 Plate.....9 25
DX, “ 11 75
DXX, “ 14 25
DXXX “ 16 75
DXXXX 100 Plate..19 25
IX, 14x14.....19 25
IC, 10x14 W.....9 25
IX, 10x14 W.....11 75
Roofing Tin.—Best Char.
IC, Terne, 14x20.....$ 9 00
IX, “ 14x20.....11 75
IC, Terne, 20x28.....19 00
IX, “ 20x28.....24 00
Coke Tin.—
IC, 10x14 Coke.....$ 9 00
IX, 10x14, Coke.....11 50
IC, 14x20, “ 10 00
Solder.—No. 1.....18c
No. 2.....15c

Pig Tin.—
Large Pigs.....44c
Small Pigs.....25c
bars.....26c
Bright Wire.
65 lbs. in bdl.....dis —
Copper.—
Sheathing.....31c
Copper Bottoms.....32c
Planished Copper.—
Sheathing, 14x48.....38c
Boiler Size, No. 7.....40c
“ “ No. 8.....40c
“ “ No. 9.....40c
Sheet Iron.—
No. 18 Am. Com.....4 00
No. 24 Am. Com.....4 20
No. 26 Am. Com.....4 40
No. 27, Am. Com.....4 60
W. D. WOOD'S & CO. 'S SHEET IRON.—
Nos. 15 to 20 Smooth $5 00
“ 21 to 24.....5 20
“ 25 & 26.....5 40
“ 21 to 24 Char'l..6 70
“ 25 & 26 “ ..6 90
RUSSIA.
Genuine.....17c
Imitation.....14c

Buy House's Double Action GIANT SPRING HINGE

The Double-action hinge, as shown when door is shut—both sides alike with four combination springs.

FOR
Banks and Offices,
CHURCHES,
School Houses,
And all
Public Buildings.

It has no equal. It swings the door both ways, forms a solid attachment on each side. Has four combination springs acting together, cannot settle nor sag. Will carry any weight, and is decidedly the Finest, Strongest, and Best made.

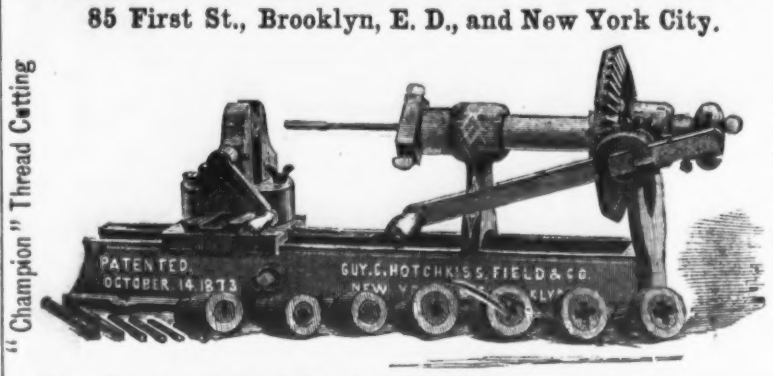
HOUSE BROS.,
Patentees & Manufacturers,
194 Broadway, N. Y.

TACKLE BLOCKS
BURR & CO.,
Manufacturers of Waterman and Russel's
Patent Iron Strapped Blocks,
ALSO, MANUFACTURERS OF
ROPE STRAPPED BLOCKS.
81 PECK SLIP, NEW YORK.

Guy C. Hotchkiss, Field & Co.

85 First St., Brooklyn, E. D., and New York City.

“Champion” Thread Cutting and Nut Tapping Machine.



This machine has revolving and sliding jams, which enables the operator to cut all kinds work, no matter how irregular in shape it may be. It cuts a perfect thread at once going over. As much work can be done in one hour by this machine as in a day with stocks and dies. Send for Circular.

Manufacture Carriage Materials, Axles, Springs, Blacksmiths' Supplies, Bolts, Wood Work, Trimmings, &c.

IMPORTERS AND DEALERS IN

IRON AND STEEL.

FOR MELTING ALL KINDS OF METALS,
And Manufacturers of

Sunny Side Stove Polish.

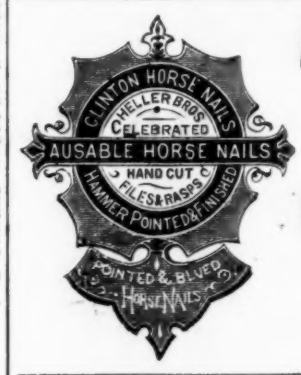
Lumber Pencils, Foundry Facings and Lubricating Plumbago.

STROW, WILE & CO.,

Nos. 1324, 1326, 1328, 1330, 1332 & 1334 Callowhill St., Phila

GENERAL AGENTS:

Messrs. HALL & CARPENTER, 709 Market St., Phila.



Ausable Horse Nail Co.

MANUFACTURERS OF

HAMMERED,
Hammer Poin ed, Polished & Blued
HORSE NAILS,
FROM
BENZON IRON.

Orders promptly filled at lowest market rates.

ABRAHAM BUSSING, Secretary,
85 Chambers Street, New York

GLOBE NAIL COMPANY,

MANUFACTURERS OF

Pointed, Polished & Finished Horse Shoe Nails

Recommended by over **20,000** Horse Shoers.

All nails made from best NORWAY IRON, and warranted perfect and ready for driving. Orders filled promptly and at lowest rates by

GLOBE NAIL CO., Boston, Mass.

THE PERFECT COMB,

MADE BY THE

LAWRENCE CURRY COMB CO.

BILLINGS & SPENCER CO.

MANUFACTURERS OF

CLAMP, DIE AND COMMON

LATHE DOGS.

Vienna, 1873

Forged from Bar Steel *And Hardened*

Under Billing's Patent Process.

For Progress.

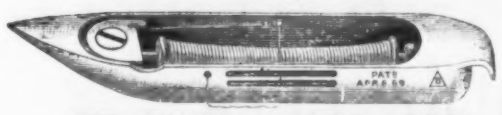
FIRST CLASS ARTICLES,

and something that every machinist and Tool Maker will appreciate.
Also, all Descriptions of **Wrought Iron & Steel**

DROP FORGINGS.

For Machine Handles, Lathe Wrenches, Spinning Rings, Marlin Spikes, Clinch Rings, Thumb Screws, Thumb Nuts, and Pa of Drill Chucks, Sewing Machines Gun , Pi and

Machinery Generally.

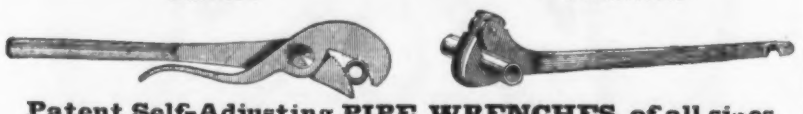


TRADE B MARK.

THE BILLINGS PATENT SEWING MACHINE SHUTTLE,

Thirty Varieties now made, Forged Solid from Bar Steel and Cold Pressed. Also,

Barwick **Wheatcroft**



Patent Self-Adjusting PIPE WRENCHES, of all sizes.

Illustrated Circulars and Price List sent to any order on request. Lawrence St., Hartford, Conn.

H. HAMMOND

Manufacturer of

CAST STEEL HAMMERS

IRON AGE, SC.

HARTFORD, CONN.

EDWARD PHELAN,

Surviving Partner of W. F. SHATTUCK & CO.,

No. 113 Chambers and 95 Reade Streets, New York,

MANUFACTURER OF AMERICAN HARDWARE.

Coes & Taft's Pat. Wrenches.
Axe Pick, Sledge & Hammer Handles.
Gimlets and Gimlet Bits.
Augers and Auger Bits.
Cocoa Nut Drippers
Wire Selves.
Scale Beams.
Patent Tap Borers.
Cortlandt Horse Nails.
Maguire's Wr't Iron Goods.
Shattuck's Platform Counter Scales.
Yaw's Cow Bells.
Axes, Picks and Hatchets.

CHAMPION BARROWS.

WITH WOOD OR IRON WHEELS.

A first-class article and a specialty, that will make a demand in any market and afford a good marg for dealers. We are prepared to furnish them in large quantities. Manufactured by

BRYAN MANUFACTURING CO., Bryan, O.

SEMPLE, BIRGE & CO., Sole Western Agents, ST. LOUIS, MO.

Middletown Tool Co.,

MIDDLETOWN, CONN.

Manufacturers of

The Celebrated "Baldwin" Plane Iron.

HENSHAW'S SNAPS

Greatly Improved in Style and Pattern.

HART, BLIVEN & MEAD MFG. CO., Agents

18 & 20 Cliff Street, N. Y.

HAMMER & CO.,

Branford, Conn.,

Manufacturers of the following *Patented* Articles of

MALLEABLE IRON:

Hammer's Adjustable Clamps.
Hammer's Malleable Iron Oilers.
Hammer's Mall. Iron Hand Lamps.
Hammer's M. I. Hanging Lamps.

For Sale by all the principal Hardware Dealers.

Malleable Iron Castings

Of Superior Quality made to order

THE BEST IS ALWAYS THE CHEAPEST.

Wellington Mills London

EMERY.

USE THE BEST.

SALE AGENCIES:

Macomber, Bigelow & Dowse, Boston, Mass.
Homer, Foote & Co., Springfield, Mass.
C. Foster & Co., - Worcester, Mass.
J. Clark Wilson & Co, New York City.
Chas. M. Ghriskey, Philadelphia, Pa.
Belcher Bros., - - Providence, R. I.
Baeder, Adamson & Co., Chicago, Ill.
Baeder, Adamson & Co., Cincinnati, O.
Clemens Vonnegut, Indianapolis, Ind.
Geo. M. Way & Co., - Hartford, Ct.
F. S. Bradley & Co., - New Haven, Ct
Apothecaries' Hall Co., Waterbury, Ct.
W. Bingham & Co., Cleveland, Ohio.

Sold by all Hardware Dealers

1776. **CENTENNIAL CURRY COMB.** 1876.

They can be grasped by the **handle directly over the top**, or **by the handle back of the comb**, as commonly used.

THEY ARE THE

Strongest and Most Durable Comb Made,

No Malleable Iron being used in their construction.

EVERY HANDLE WARRANTED KEYED ON.

They have no Wire

Running through the bars to catch the

HAIR AND DIRT.

Catalogues furnished on application.

Manufactured by

Wm. P. Kellogg & Co.,

Troy, N. Y.

SOLE AGENTS,

Wiebusch & Hilger Hardware Co,

84 & 86 Chambers Street, N. Y.

Patented May 4th and Dec. 21st, 1875.

THE EMPIRE

FAN BLOWING

PORTABLE FORGES.

Patented in U. S Nov. 25, 1873. Patented in Canada May 28, 1874.

COSTING FROM $16·00 TO $75·00.

We desire to call your attention to our new Forge, No. 12. They are especially convenient for Boiler Makers' repairs, weighing only 50 lbs; they can be easily carried around the country, and will make a fire hot enough to melt ¾ or 1 inch iron in two minutes. They are a very useful tool for Machinists to set up on their work bench—always ready and handy for mending and tempering tools, and like work—and are so cheap that every mechanic can afford to complete his "kit of tools" by owning a Forge. We make 28 sizes of Portable Forge, designed for all purposes of metal working. Send for catalogue to

EMPIRE PORTABLE FORGE CO., Troy, N. Y.

John T. Lewis & Bros.,

No. 231 South Front St.,

PHILADELPHIA.

TRADE MARK.

MANUFACTURERS OF

PURE WHITE LEAD, RED LEAD, Litharge, Orange Mineral, Linseed Oil

AND PAINTERS' COLORS.

TRADE MARK

The Atlantic White Lead and Linseed Oil Company,

MANUFACTURERS OF

White Lead (Atlantic), Red Lead, Litharge & Linseed Oil.

ROBERT COLGATE & CO.,

287 Pearl Street, New York.

Established A. D., 1777.

WETHERILL & BRO.,

Manufacturers of

White Lead, Red Lead, Litharge & Orange Mineral.

Offices, 31st. St. below Chestnut, PHILADELPHIA.

Brooklyn White Lead Co.

TRADE MARK.

White Lead, Red Lead and Litharge.

89 Maiden Lane, NEW YORK.

FISHER HOWE, Treas.

JOHN JEWETT & SONS,

Manufacturers of the well known Brand of

WHITE LEAD.

TRADE MARK.

Also Manufacturers of

LINSEED OIL

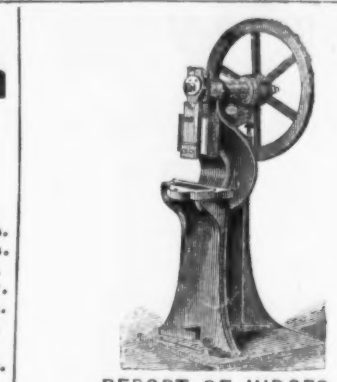
182 Front Street NEW YORK

STOVE LID LIFTER.

KETTLE TIPPER.

AMERICAN MFG. CO., 102 Orange Street, New Haven, Conn.

Send for Circulars. See Notice page 9 Nov. 11.



REPORT OF JUDGES

In Department V, Group 3, at the 44th Exhibition of the

AMERICAN INSTITUTE,

Held in the City of New York, Oct., 1875.

No. 318, Drawing, Drop & Punching Presses.

THE STILES & PARKER PRESS CO.,

Of Middletown, Conn.

The machinery exhibited by these makers is of a character that calls for special commendation. In addition to their well known punch ng presses, to which a new feature has been added in a press adjustable to an inclination for discharging work left above the die, there are exhibited by them a combined punch and sheare, a drawing or blanking press, and a drop.

In all these there is shown the highest mechanical culture, applied to meet every practical requirement, to avoid every practical difficulty, and to enlarge the range of application of the machines, by devices which are at once simple, elegant, and effective.

Your committee would unhesitatingly recommend for this exhibition the "Medal of Progress," but find such award debarred by the rule of the Institute, forbidding such award unless a Silver Medal has been previously awarded. We, therefore, respectfully recommend the award of a Silver Medal.

Silver Medal Awarded.

A true copy from the Report on file.

JOHN W. CHAMBERS, Sec'y.

WOODEN TOOTH

Curry Comb.

The Best yet Invented.

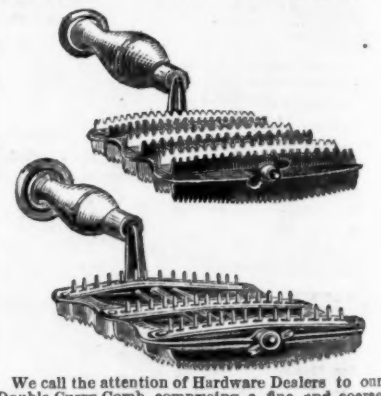
CHEAP AND DURABLE.

Is Pleasant to the Horse, and does not injure the Brush.

FULLER BROS., Sole Agents,

89 Chambers & 71 Reade Streets, N. Y.

DUPLEX CURRY COMB.

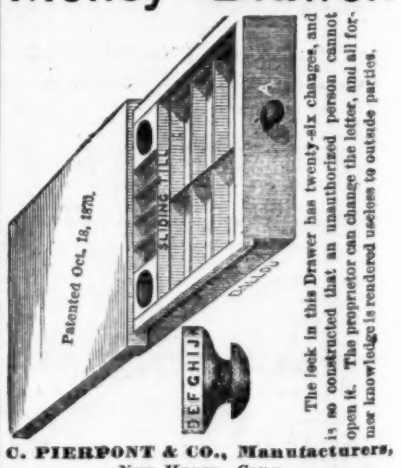


We call the attention of Hardware Dealers to our Double Curry Comb, comprising a fine and coarse side; or virtually two combs in one. It is useful, durable and novel, and needs no argument to convince any one of its practicability. It sells on sight, and is bound to supersede all other combs. We want one reliable dealer in each state or large city to handle it. Correspondence solicited.

Address I. N. CASSELL, Fredericktown, Ohio.

EXCELSIOR

Money Drawer.



The lock in this Drawer has twenty-six changes, and is so constructed that an unauthorized person cannot open it. The proprietor can change the letter, and all former knowledge is rendered useless to outside parties.

C. PIERPONT & CO., Manufacturers, *New Haven, Conn.*

Semple, Birge & Co., General Western Agents, 13 S. Main St., St. Louis, Mo.

EDWARD SWEENEY, Brass Founder,

Manufacturer of

GONG BELLS

Steamboat and Locomotive Gongs kept on hand. A liberal discount to the trade. Bell Hanging and Jobbing done to order. 4 DUANE STREET,

Bet. Rose and William St., NEW YORK.

NEWCOMB BROS.

Manufacturers of

Smiths', Moulders' and Hand

BELLOWS.

For further particulars send for descriptive circular and price list.

586 Water St., near Montgomery, N. Y.

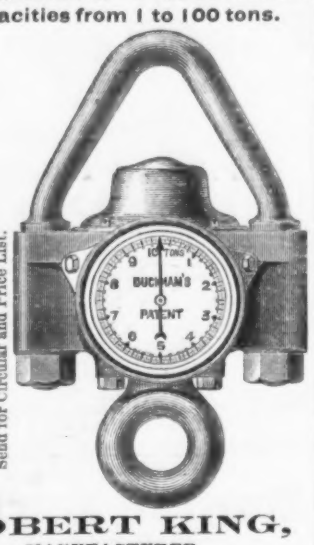
J. CLARK WILSON & CO., Agents, 81 Beekman Street, New York.

THE "DUCKHAM" PATENT

Suspended Self-Indicating

WEIGHING MACHINE.

Capacities from 1 to 100 tons.



This machine is used on a crane or any lifting apparatus, and indicates the weight on the dial directly the article is lifted. It is accurate, requires no adjusting, portable, and the greatest labor-saving weigher ever introduced. Send for Circular and Price List.

ROBERT KING,

MANUFACTURER,

Hydraulic Presses, Accumulators, &c.

246 to 250 Plymouth St., Brooklyn, N. Y.

JAMES HENSHALL,

Engineer, Machinist & Blacksmith,

1056 Beach St. PHILADELPHIA.

Drawings made to order. Repairing of all kinds promptly attended to. Blacksmithing executed in all its branches.

Richmond Steam Forge.

J. R. JOHNSON, Richmond, Va.

FORGING of all kinds,

Such as Steamboat, Stationary Engine and Crank Shafts, Locomotive, Truck and Car Axles, Crank Pins, Piston and Connecting Rods; Also, Hammered Bar Iron of all sizes and lengths.

Locomotive, Truck and Car Axles a Specialty.

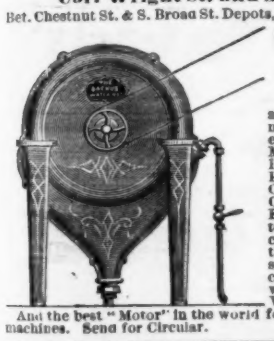
BACKUS BROTHERS,

Manufacturers of

The Backus Water Motor,

Cor. Wright St. and Ave. A,

Bet. Chestnut St. & S. Broad St. Depots, Newark, N. J.



What They will do.

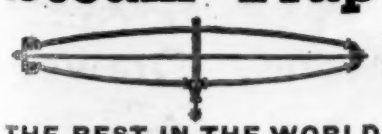
These Motors are adapted to running light machinery, such as Coffee Mills, Printing Presses, Lathes, Drug Mills, Church Organs, Sausage Cutters, Ice Cream Freezers, Elevators, Hoisting Machines and everything requiring similar power, in cities or towns where there are Water Works.

And the best "Motor" in the world for family sewing machines. Send for Circular.

STEAM PUMPS

Manufactured by CRANE BROS. MFG. CO., Chicago.

BARR'S ELLIPTIC Steam Trap



THE BEST IN THE WORLD

SEND FOR A CIRCULAR

Richards & Pike.

5th St, below Columbia Ave., Philadelphia

SUPPLIES

FOR

Railways, Machinists and Amateurs,

Gum and Leather Belting, Packings and Cotton Waste, Babbit Metal.

FINE TOOLS

for Machinists and Amateurs; Barnes' Foot Power Scroll Saw; Foot Lathes all kinds. Sole Agents Baxter Steam Engine. Iron and Wood Working Machinery. Send for Price Lists.

JACKSON & TYLER,

16 German St., Baltimore, Md.

Lester Oil Co.

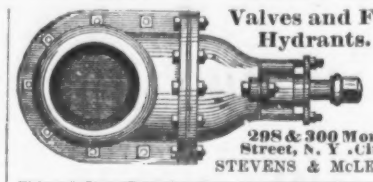
183 WATER ST., N. Y.

Exclusive manufacturers of the Renowned

Synovial Lubricating OILS.

The most Durable, Reliable & Economical Lubricant in existence;

applicable to every grade of machinery. Send for Circular and Price List.



Valves and Fire Hydrants.

298 & 300 Monroe Street, N. Y. City.

STEVENS & McLEAN.

S. RADCLIFFE,

206 West, & 53 Harrison Sts., N. Y.

Manufacturer of

HAIR AND WOOL

Boiler Felting.

Boilers Measured & Estimates Furnished.

Verona Tool Works.

METCALF, PAUL & CO.,

Pittsburgh, Pa.

Sledges, Hammers,

AND SMITHS' TOOLS,

AND THE STANDARD

Verona Solid Eye Picks.

All warranted the Best Solid Cast Steel.

Grindstones, Emery, &c.

Walter R. Wood,

GRINDSTONES.

SOLE AGENT OF THE

BEREA STONE CO., of Ohio.

NOVA SCOTIA and other brands.

283 & 285 Front Street, New York.

Family GRINDSTONES.

IMPROVED READING PATTERN.

½ doz. in case.

6 inch diam., per doz.	$9 25
7 " " "	10 50
8 " " "	11 25
9 " " "	12 75
6 to 10 inch, not mounted, per doz.	2 50

WORTHINGTON & SONS, Mfrs.,

North Amherst, Ohio.

And 456 Fifth Avenue, Chicago, Ills.

BRADY MFG. CO.,

Manufacturers of

Emery Wheel Machinery

Keep constantly on hand everything pertaining to the

USE OF EMERY.

Automatic Knife Grinders.

Universal Grinding Machines,	Belting Machines,
Emery Grinders,	Roll Grinders,
Buffing Machines,	Reamer Grinders,
Polishing Jacks,	Hag Wheel Jacks,
Flange Pulleys,	Universal Surfacing Machines.

Send for Illustrated Catalogue.

240, 242 & 244 Plymouth St., Brooklyn, N. Y.

OIL STONE

BOYD & CHASE,

388 to 406 East 107th st., N. Y.,

The largest manufacturers in the world of

ARKANSAS & WASHITA OIL STONE.

Also, *Hindostan, Sand* and *other Stone.*

Send for circular. Orders solicited from the trade. Superior Hindostan Stone finished especially for Retail Trade.

EMERY WHEELS AND MACHINERY

Upon which to run the same, of all kinds.

EMERY Emery Cloth, Mill Stone CEMENT.

TRADE MARK.

DIAMOND Tools, Oil Stones

Soapstone Register Borders.

For particulars, address,

UNION STONE CO.,

14 Exchange and 26 Devonshire Streets, Boston, Mass.

And Shaped Diamond Carbon Points, indispensable for Turning Emery Wheels, Grindstones, also Truening up hardened Steel and Paper Calender Rollers, &c. Address, J. DICKINSON, Patentee, *64 Nassau Street, New York.*

BUFFALO

Bellows Factory and Planing Mill.

ESTABLISHED 1852.

JOSEPH CHURCHYARD,

Contractor, Builder

AND

Manufacturer,

CLINTON, cor. ADAMS STS.,

Buffalo, N. Y.

SASH, BLINDS, DOORS,

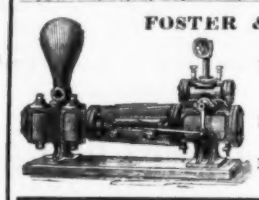
Cisterns, Tanks, Stairs, Hand Rails, Newels, Mirror Frames, Mantels, Curtain Cornices, Book Cases, Veneered Doors, Mouldings, and complete interior and exterior finish for houses.

ROUGH AND PLANED LUMBER,

Flooring, Siding, Shingles, Lath and Fence Posts.

Blacksmiths' & Moulders' Bellows.

Standard SCOTT'S Bellows.



FOSTER & JAMIESON,

Manufacturers of

The Jamieson Patent Steam Pump, and Foster's "Excelsior" Rotary Pumps.

No. 13 Adams Street, Brooklyn, N. Y.

BOSTON.

(Reported by Macomber, Bigelow & Dowse, 156 to 164 Oliver St.)

Anvils.—"Eagle American".....per lb. 10c; dis 20 %
Augers.—Watrous Ship.....dis 10 %
L'Hommedieu Ship.....dis 15 %
Axes.—Blue Jacket.....11 00
Racer.....10 00
Boy's Handled Blue Jacket.....11 00
Axe Handles.—Wadleigh's Oak-A (Extra, $2 50. B (No. 1) $2 00. C (No. 2) $1 50 ₩ doz
Bells, Sleigh—
Fancy Body, Patent Leather, Cloth Bound, White Metal, 30, No. 1.....$1 70
Fancy Body, Patent Leather, Cloth Bound, White Metal, 36, No. 1.....1 80
Fancy Body, Patent Leather, Leather Bound, Extra Tinned, 30, No. 1.....2 38
Fancy Body, Patent Leather, Leather Bound, Extra Tinned, 36, No. 1.....2 50
Fancy Body, Patent Leather, Leather Bound, Silver Plated, 30, No. 1.....3 38
Fancy Body, Patent Leather, Leather Bound, Silver Plated, 36, No. 1.....3 50
Shaft, Strap, White Metal, House Bells, extra, 6, No. 1.....per pair, 50c.
Common, 6, No. 1.....45c.
Blind Hinges.—
Orr or Washburn's.....per hundred sets $9 50
Blind Fasts.—
Orr or Washburn's.....per hundred set $6 00
Bolts.—Carriage, Phila., "Girard Works....dis 50&10 %
Borax.—Best Refined.....₩ ℔ 15c
Borers.—Angle, Backus'.....dis 30 %
Boring Machines.—Angle.....each $4 75
Common, Snell's quality.....each 2 75
Braces.—Barber's.....dis 40&5 %
Backus'.....dis 50 %
Spofford's.....dis 50 %
Amidon.....dis 50 %
Brackets.—Star bronzed.....new list net
Star Japanned.....new list net
Store Shelf.....new list net
Brass Faucets.—L. P. & Co.....dis 25& 10 %
Brushes.—Horse, Patent Metallic.....per doz. $4 75
Butts.—Union Drilled Loose Joint.....dis 40&10 %
" " Wire Fast Joint.....dis 25&10 %
" " Acorn Loose Joint...dis 45&10 %
Brass Butts.....dis 30 %
Wrought Table Butts and Back Flaps.....revised list, dis 30 %
Wrought Narrow Butts.....reduced, dis 30 %
Cards.—
Curry Cards, No. X, per doz., 40 35.....dis 30 %
Horse " No. X " 0 80.....dis 30 %
Wool " No. 8X " 2 50.....dis 15 %
Cotton " No. 10, " 3 50.....dis 10 %
Cartridges.—" U. S. Cartridge Co.....dis 60 %
Chisels.—"Buck Bros.' Shear Goods.....add 22½ %
Sockets.....add 25 %
Churns.—Lightning—
Redheffer patent.....per doz $22 00 | 3 | $27 00 | 4 | $31 50 | 5 | $36 00 | 6 gall
Coal Hods.....dis 40 %
Fancy Japanned, No. 4, 15 in., $8 00; 5, 16 in., $9 00; 6, 17 in., $10 00.
Fancy Galvanized, No. 4, 15 in., $11 50; 5, 16 in., $13 00; 6, 17 in., $14 00.
Perfection, Jap'd, No. 4, 15 in., $12 00; 5, 1 in., $13 00; 6, 17 in., $14 00.
Perfection, Galv'd, No. 4, 15 in., $15 00; 5, 16 in., $16 00; 6, 17 in., $17 00.
Morning Glory, Jap'd, No. 4, 15 in., $12 00; 5, 16 in., $13 00; 6, 17 in., $14 00.
Morning Glory, Galv'd, No. 4, 15 in., $15 00; No. 5, 16 in., $16 00; No. 6, 17 in., $17 00.
Compasses and Dividers.—Bemis'.....dis 40 %
P. S. & W.....dis 30 %
Cordage.—Manila (usual trade dis.).....₩ ℔, 14½c
American Tarred Hemp Lath Yarn.....₩ ℔, 10c
Corn Hooks.....per doz $2 75
Cow Ties.....dis 10 %
No. 30, Open Ring, 3 foot, No. 6, with Toggle....$3 70
No. 35, " 3 " No. 6, " Snap.....3 90
No. 40, " 3½ " No. 4, " Toggle....4 00
No. 45, " 3½ " No. 6, " Snap.....4 30
No. 50, " 4 " No. 5, " Toggle....4 70
No. 55, " 4 " No. 5, " Snap.....4 90
No. 60, " 4½ " No. 4, " Toggle....5 30
No. 65, " 4½ " No. 4, " Snap.....5 40
Crow Bars.—Iron. Steel Points.....₩ ℔, 5½c
"Sweet" Steel Bars.....₩ ℔ 11c
Brown's Steel Bars.....₩ ℔ 10c
K. P. & Co. Extra Drill Steel.....₩ ℔ 15c
Dividers.—Cook's Nickel Plated.....dis 15 %
Door Springs.—Moseley—

Per doz.	$9 00	12 00	15 00	18 00	24 00
No.	0	1	2	3	4

Torrey's.....$3 00
Gem.....1, $3 50; 2, $2 50; 3, $2 00 ₩ doz
Egg Beaters.—Lightning, Redheffer pat., pints, $5 50; 1 qt., $8 00; 2 qts., $12 00 per doz.
Emery.—Alden.....₩ ℔ 6½c
Wellington Mills.....₩ ℔ 10c
Files.—Earl Smith & Co.'s English.....$5 to £ gold
American.....$5 to £ currency, ic—5 %
Nicholson.....new net list
Wheeler, Madden & Clemson.....$5 to £
Stubb's Tapers, genuine, 3 in., $1 50; 3½, $1 62½, 4, $1 75; 4½, $2 13; 5, $2 50.
Funnel Irons.—$2 50 | 2 50 | 3 50 | $3 25 per doz
5 | 5½ | 6 | 7 inch.
Deep Flange.—$3 50 | 3 75 | 4 00
5 | 5½ | 6 inch.
Hammers.—Maydole.....dis 12 ½
M., B. & D., solid cast steel, adze eye, No. 1, $10; 1½, $9 75
" " " " " bell face, No. 1, $11; 1½, $9 75.
Hangers & Rollers.—Novelty.....dis 30 %
Anti-Friction.....dis 30&5 %

Hatchets.—Underhill Edge Tool Co.....dis 15 %
C. F. Dowse, warranted Cast Steel—
Shingling.....0, $4 75; 1, $5 25; 2, $5 75
Claw.....1, 5 75; 2, 6 25
Lathing.....1, 5 50
Axe Pattern.....1, $7 00; 2, 7 50
Broad.....0, $5 25; 1, $6 50; 2, $7 50; 3, $9 25; 4, $10 75; 5, $12 25; 6 $14 25
Hinges.—Strap and T. Stanley Works.....dis 40 %
Plate, Loose and Fast Joint.....₩ ℔ 6c
Wrought Screw Hook.....₩ ℔ 6½c
Knobs.—Young's Imp. Silverd Glass.....dis 45 %
Lanterns.—Tubular No. 0.....$ 9 50
Guarded, No. 74, (with kerosene oil and candle burners).....5 50
Anti-Tubular.....8 00
Lead.—Sheet, 9½c.; Pipe, 9c.....less 10 %
Locks.—Norwalk Lock Co.....reduced list, dis 40&5 %
Mattocks.—
K. P. & Co., axe finish, long cutter.....$13 00—net
Short cutter.....12 75—net
Meat Cutters.—" Miles'" Challenge.....dis. 20 %
No. 1, $22 00; 2, $20 00; 3, $40 00.
Metal.—Babbitt, No. 1, 35c; 2, 25c; 3, 16c; 4, 15c ₩ ℔
Nails.—100 and larger.....$3 25 net
Nail Pullers.—Little Giant—Small.....per doz., $22 00
Little Giant—Large....." $30 00
Padlocks.—Wilcox.....reduced list, dis 40&5 %
Paper.—Tar'd Sheathing.....₩ ℔ 2 c
Dry Sheathing....." 3 c
" " "Beaver Brand" Rosin Sized.. " 4½c
Tar'd " " " " 5 c
Felt " " " " 4½c
Virginia Cane Fibre.....4½c
Picks.—K. P. & Co., Solid Eyes.....5 to 6 | 6 to 7
$9 00 | $9 50
Pins.—Universal Hat and Coat all wood—
2 in.....₩ gross $2 50; 3 in., 3 50; 4 in., 4 50—dis 15 %
Potato Digger.—
"Partridge," 6 square tine.....₩ doz $12 00
Shumway & Co., 6 round tine.....₩ doz 9 00
Pulleys.—Axle.
Frame Pol. Wheel....No. 150, 70c., 1¼ in.; 16, 38c., 2 in.
Common Axle.....No. 18, 34c., 1¼ in.; 26, 40c., 2 in.
Milled Axle.....No. 2, 42c., 1⅝ in.; 8, 50c., 2 in.
Nashua Pat. Axle Bronzed Face...1⅝ in., 80c.; 2 in., 90c
Cast Steel Axle.....2 in., $1 00
Pulley Blocks.—"Best Boston Make".....net
Common Strapped Blocks—

	4	5	6	7 inch.
Single, 75c.	85c.	$1 00	$1 13	each.
Double, $1 00	1 12	1 25	1 60	"

Inside Iron Strapped Blocks—

	5	6	7				
							10 inch.
Single,	$1 00	1 13	1 38	2 00	2 25	2 75	each.
Double,	1 88	2 30	2 63	3 63	4 00	5 00	"

Inside Iron Strapped Blocks, with Patent Roller Bushings—

	5	6	7	8	9	10	inch.
Single,	$1 25	1 50	1 85	2 00	2 25	3 50	each.
Double,	2 50	3 00	3 38	4 63	5 00	6 50	"

Plated Ware.—Rogers bros.....dis 50 %
Plumb & Levels.—"Davis" Pat. Adjustable—
No. 1, Iron and Wood Center Levels.....dis 50 %
No. 2, First Quality Levels.....dis 60&10 %
No. 3, Iron Pocket " .....dis 35 %
No. 4, Level and Plumb Glasses.....dis 60&10 %
No. 5, Iron Pocket Levels, per square and straight edge.....dis 50&10 %
No. 6, Improved Iron Bench Planes.....dis 50&10 %
Pocket Knives.—Conn. Cutlery Co.....new net list
American Shear Co.....new net list
Rail Barb Door.—For Novelty and Anti-Friction Hangers.....per foot 7c., dis 30 %
Rivets.—Black.....dis 50 %
Carriage, oval head, Nos. 3, 4, 5, 6, 7, 8, dis 35 %
13 | 13 | 14 | 14 | 15 | 16c ₩ ℔
Rubber Moldings.—" Harmon's".....dis 10 %
No. 2, for Windows.....per foot, 5c
No. 3, for Doors.....per foot, 10c
No. 4, " .....per foot, 12c
Miller's Patent.....per foot, 4½c
Sad Irons.—Bliss & Drake.....₩ ℔ 7c
Sand Paper.—0 to 2, $4 25; 2 to 3, $4 75.....dis 10 %
Saws.—*Hand and Panel*—
Wheeler, Madden & Clemson's, same list as "Disston's".....dis. 15&5 %
Disston's.....dis. 12½ %
Cross Cut—
Wheeler, Madden & Clemson X Cuts.....per ft., 37c
" " " "Star" X Cuts, " 60c
" " " Champion X Cut. " 50c
" " " One Man X Cut..each, $2 25
Boynton's genuine Lightning X Cut.....per ft., 50c
" " One Man X Cut..each, $2 00
Circular—Wheeler, Madden & Clemson's.....dis. 25 %
Mill— " " " .....dis. 25 %
Screws.—Am. Screw Co., new list Sept. 1st.....dis 40 %
Aiken's.....dis 40 %
Scythe Stones.—
"Willoughby Lake," first quality.....₩ gross $6 50
" " second quality.....$3 00
Shovels.—O. Ames.....dis 20 %
M. B. & D.....dis 20 %
Snow, Malleable Iron Tip, D Handle—Agents for New England.....$6 50
Snow, Malleable Iron Tip, long Handle—Agents for New England.....5 50
Sifters.—Coal, Rice, &c.....$12 00
Spading Forks.—W. C. & Co.....dis 30 %
Stone Pickers.—"Partridge," original...₩ doz $15 00
Tools.—Aiken's Pattern, 40 in set; Parr's.....15 per doz
Traps.—Oneida.....dis 25 %
Blake's.....dis 30 %
Vises.—K. P. & Co.'s Solid Box. Blacksmith.....₩ ℔ 13c
Parker's Parallel.....dis 10 %
Backus.....dis 25 %
"Howards." Parallel.....dis 20 %
Wardrobe Hooks.—Wire to drive.....₩ gross $1 00
Weather Strips.—" Harmon's" ...per doz $5, dis 10 %
Weights.—Window Weights.....₩ ℔ 1½c
Wedges—Axe.....₩ doz 35c
Wire.—
Eureka, in spools, No. 28 to 40 assorted...₩ gross $3 50
Wire Netting.—Clinton Wire Cloth Co., Green, Drab or Black.....₩ ft 5c
Wrenches.—Genuine Wrenches, G. A. Cores..dis 40&10 %
Walton.....dis 50 %
Wringers.—
Novelty and Universal } Tub No. 2 } .....Less than 2 doz, $72 00
.....2 doz or more, 70 00
Bench A... less than 2 doz $86 00; 2 doz or more $84 00
" B... " " " 94 00 " " 92 00
" C... " " " 110 00 " " 107 00
Eureka.....60 00 " " 58 00
Withington, Cooley & Co.—
Hoes, Rakes, Forks, &c.....dis 30 %

Boston Metal Market.

(Corrected by Fuller, Dana & Fitz, 110 North Street, Boston, Importers and Commission Merchants.)

December 18, 1875.

Iron.—Best Refined Bar Iron.....₩ ton $52 50
" Burden Best " " 95 00
Swedish Bar Iron.....gold " 110 00
Norway Shapes.....gold " 122 50
Norway Nail Rods.....gold " 130 00
Sheet Iron, American.....₩ ℔ 4½c
" " Galvanized.....gold " 9 c
" " Russian.....gold " 13½c
Plate Iron, C. No. 1.....3½c
Iron Rails.....₩ ton $47 50
Steel Rails....." 52 50
Pig Iron, Foundry, No. 1 extra.....25 50
" " No. 2 extra.....23 50
" Gray Forge.....21 50
" Scotch.....30 00 @ 32 00
Wrought Scrap Iron....." 21 00
Old Rails.....28 50
Steel.—₩ ℔
Eng. Tool, gold 15½c | German.....₩ ℔ 9 c
American Tool 14½c | Spring.....8 c
" Mach 9 c | Tire.....6 c
Reasemer 7 c | Sleigh Shoe.....4½c
Toe Calk.....7 c
Tin Plates.—₩ box gold | **Copper.**—₩ ℔
I. C. Char. 10x14.....$7 75 | Ingot.....23½c
I. C. Coke 10x14.....7 00 | Bolt.....30c
Char. Roof. IC. 14x20. 7 25 | Sheathing.....30c
Coke " IC. 14x20. 6 25 | **Lead.**—₩ ℔
METALS. | Pig.....7½c
Pig Tin.—₩ ℔., gold | Sheet & Pipe.....8 1-10c
Banca.....24c | **Zinc.**—Sheet..₩ ℔ 10½c
Straits.....18½c | **Spelter.**.....₩ ℔ 7½c
English.....19½c | **Antimony.** gold ₩ ℔ 13½c

ST. LOUIS.

Corrected weekly by Semple, Birge & Co.

Apple Parers.—Conqueror.....₩ doz. $7 75
Hudson's Rotary.....7 75
Axes.—Wm. Mann's, Red Warrior.....₩ doz. $11 50
Wm. Mann's, W. Stewart's.....12 00
" " C. Marshall.....10 50
" " Handled.....$5 extra
" " Double Bitted.....2 50
H. L. B. & Co.'s, L. & Co.....11 50
" " Pioneer.....12 00
" " James & Co.....11 00
Hunt's.....12 00
Axles.—"Jones, Henry & Co.'s" Patent Lubricating, Half Patent, Swelled Taper, Plain Taper and Concord Axles.....dis 15 & 5 %
Common Axles (Pat. Lubricating), 1¼ inch and upward.....₩ ℔. 6½c.
do. less than 1¼ inch.....7 c.
Bellows.—Best St. Louis make. 30c ₩ in. dis 20&2½ %
Bells.—Troy, Church, School and Farm Bells. ₩ ℔ 40c
"Improved Amalgam Bronzed," 15 in., $2 10; 17 in., $2 85; 19 in., $4 10; 21 in., $5 35.....dis 10 %
Belting.—"Boston Belting Co.'s Rubber.....dis 40 %
"Bradford & Sharp's" Oak-Tanned Leather.....dis 30 %
Boats.—Metallic, Sectional, Bond's Patent.....dis 10 %
Bolts.—Arms, Bell & Co.'s Carriage & Tire...dis 70&10 %
Arms, Bell & Co.'s Machine.....dis 40&10 %
Butts.—Western Butt Co.'s new list—
Narrow Fast Joint.....dis 25& 10 %
Broad Fast Joint.....dis 3 & 10 %
" Loose " .....dis 45&10 %
Reversible.....dis 40&10 %
" Japanned and Silver Tipped.....dis 45&10 %
Loose Joint "Acorn" " " " .....dis 45&10 %
Wheeling Hinge Co.'s W't Fast Joint Narrow.....dis 30 %
" " " Broad.....dis 35 %
" " Loose Joint.....dis 35 %
" " Reversible.....dis 35 %
" " Table & B'k Flaps.....30 %
Churns.—Julian, No. 2, $7 00; No. 3, $7 50; No. 4, $8 50.....dis 20 %
Cider Mills.—
American Senior, $40 00; Am. Junior, $25 00.....dis 20 %
Corn Drill.—Campbell's Patent.....each $30 00
Corn Knives.—Dunn Edge Tool Co.'s Chip...₩ doz 5 00
Seymour Mfg. Co.'s Solid Steel Back.....4 00
Corn Shellers.—Sandwich Mfg. Co.'s—
Power Shellers.....dis 10 %
Hand Shellers.....Special rates
Cotton Gins.—The Carver, 10 in. saw, $4 a Saw...dis 15 %
12 in. Saw, $4 50 a Saw.....dis 10 %
Crow Bars.—Steel Pointed.....₩ ℔ 6½c
Drag Saw Machines.—
Culver's Iron Drag Saw.....dis 10 %
Robinson's Patent Sweepstakes Drag Saw.....dis 10 %

Fanning Mills.—Nash & Cutt's.....dis 30 %
Feed Cutters.—Improved Burdick Na tional...dis 30 %
Sanford No. 1, $10 75; No. 2, $8 00.....net
Files.—Black Diamond, Mill.....$5 00 £ currency.
" Bastard.....5 00 £ currency.
" Taper.....5 00 £ currency
Forges.—Keystone Portable Forge Co.'s.....dis 12½ %
Forks and Hoes.—
Auburn Mfg. Co.'s Hay and Manure Forks.....dis 10 %
" " Handle Hoes.....dis 30 %
Garden Seed Drills and Wheel Hoes.
Allen's Double Wheel Hoe.....dis 15 %
" Planet Drill, Nos. 2 and 3.....dis 15 %
" Combined Drill and Wheel Hoe.....dis 15 %
Grinding Mills.—Challenge Feed Mills.....dis 15 %
Sedgebeer's Nonpareil Mills.....dis 15 %
Bradford's French Burr Mills.....net list
Hammers.—Masons' Hammers.....₩ ℔ 20c
Smiths' Hand.....20c
Handles.—No. 1 Fork, Hoe and Rake.....dis 20&
No. 2 Fork, Hoe and Rake.....dis 40 %
Harrow Teeth.—1 inch iron.....₩ ℔ 4½c
⅞ and ¾ inch iron.....4½c
Barbed or Headed.....½c extra
Hay and Cotton Presses.—
Dederick's Railroad.....net list
" Perpetual.....net list
Hay Knives.—
Dunn Edge Tool Co.'s.....₩ doz $15 00—dis 15&5 %
Lightning (Weymouth's Patent).....₩ doz $30 50
Hinges.—
Wheeling Hinge Co.'s Strap & T.....dis 33⅓&10 %
Horse Hay Forks.—Nellis' Harpoon.....$9 00 net
Horse Nails.—National Patent Pointed.....20c rates
National Patent Polished, extra finished.....25c "
Horse Powers.—Pitts or Carey's Patent.....dis 10 %
Wheeler's Railway.....dis 10 %
Sandwich Lever.....dis 10 %
Horse Rasps.—Heller Bros.....dis 45 %
"Black Diamond".....$9 00 to the £ currency
Horse Shoes.—
Rhode Island (Perkin's Pattern).....₩ keg, $5 50
" Mule....." 6 00
" Trotting Shoes....." 8 00
Tredegar Horse.....per keg $5 50
" Mule.....per keg 6 00
Hose.—
Boston Belting Co.'s Rubber Medium Sizes..dis 30&10 %
" " Small Sizes, Hydraulic.....dis 40 %
Ice Tools.—W. T. Wood & Co.'s Saws.....new list net
W. T. Wood & Co.'s Chest Hatchets.....new list net
" " Axes.....new list net
" " Loading Tongs.....new list net
" " Medium, Small and Family Tongs.....new list net
" " Chisels, Hooks and Grapples.....new list net
Mattocks and Grub Hoes.—
Klein, Logan & Co.'s Mattocks..₩ doz $13 00 @ 13 50
" " Grub Hoes, oval eye.....10 00 @ 11 50
Money Drawers.—
Pierpont & Co.'s Excelsior.....per doz $35 00 net
Nails.—Wheeling Riverside Brand..$3 85 to $3 90 net
Packing.—Boston Belting Co.'s Rubber, Plain..dis 30 %
Boston Belting Co.'s Rubber, Pure.....dis 25&5 %
" " No. 2 Plain.....dis 40 %
" " Round and Square....dis 10&10 %
Picks.—Klein, Logan & Co.'s Railroad and Clay.....₩ doz $9 30 @ 11 00
Klein, Logan & Co.'s Coal....." 7 45 @ 8 40
" " Pole....." 12 60 @ 15 50
" " Stone....." 14 40 @ 14 90
" " Tamping....." 14 75 @ 15 85
" " Miners' Drifting....." 10 25 @ 12 80
Plows.—Avery's Cast and Steel.....dis 20 %
Collins Cast Cast Steel.....new list net
Perkin Steel.....dis 20 %
Post Hole Augers.—Clark's Patent—
No. 1, ₩ doz. $27; No. 2, $30; No. 3, $22.....dis 30%
Pulleys.—5 inch.....per doz $4 25 net
4 inch.....per doz 3 25 net
Nellis' Patent.....new list dis 15 %
Pumps.
St. Louis, Farm, Patent Metal Lined...new list dis 50 %
Rakes.—Paddock's Premium Sulky.....$29 00 net
St. Louis Revolving 14 tooth.....5 00 net
" " 16 " .....5 25 net
" Hand Hay Rake.....dis 20 %
Reaper Knives and Sections.—
Geo. Barnes & Co.'s Knives.....dis 40 %
" " Sections.....dis 40 %
Road Scrapers.—Steel.....$9 50 net
Cast Iron.....dis 10&5 %
Sad Irons.—Monitor Brand, Silver Polished..₩ ℔ 4½c
Sash Weights.—Standard Solid Eyes.....₩ ℔ 4c
Saws.—Curtis & Co.....dis 10 %
Scythes.—Dunn Edge Tool Co.'s.....dis 30 %
Scythe Stones.—No. 1 Ind'a Pond ₩ gr's, $7 00
Extra Indian Pond.....$ 7 50 } dis 30 %
Premium....." 10 50 }
Diamond Grit....." 13 00
Shovels and Spades.—H. M. Myers & Co.....dis 30 %
Grain Scoops, Pat. Cor'd Straps H. M. M. & Co...dis 30 %
" " M. Rowland & Co.dis 30 %
" " O. Ames & Son..dis 20 %
Sledges.—Smith's Stone or Coal Sledges—
Steel Face Polished.....₩ ℔ 15c
Solid Cast Steel....." 35c
Spaths and Cradles.—Seymour Mfg. Co.'s..dis 20 %
Sorghum Machinery.—Bell Cane Mills.....dis 15 %
Scantlin's Seamless Evaporators.....dis 10 %
Springs.—Cleveland Spring Co.'s—
Carriage and Express.....dis 12½ %
Blue Seat Springs.....dis 15 %
Vises.—Solid Box.....₩ ℔ 16c
Wilson Mfg. Co.'s.....dis 15 %
Wheelbarrows.—Champion Iron wheel..₩ doz $35 00
Champion Wood Wheel.....₩ doz 30 00
Wrenches.—Coes' Genuine.....dis 33⅓&
Coes' Pattern.....dis 50
Wagons.—Whitewater Farm Wagons—
Thimble Skein.....No. 3, 3/4 : ¼, $78; 3½, $79
Iron Axle.....No. 1¼ $73; ⅜, $81; 1⅜, $88

St. Louis Metal Market.

(Corrected Weekly by Messrs. R. Sellers & Co.)

Tin Plate.

IC, 10x14, Best Char.	$ 9 50	IX, 14x20, Roofing	$11 50
IX, 10x14, "	12 00	IC, 20x28, "	19 00
IC, 12x12, "	10 00	IX, 20x28, "	23 50
IX, 12x12, "	12 50	IC, 10x14, Coke	8 50 @ 9 00
IC, 14x20, "	10 00	IC, 14x20, "	9 00
IX, 14x20, "	13 00	IC, 10x20, "	14 00
IC, 14x20, Roofing	9 00		

Usual difference for odd sizes.

Block Tin.

Large Pigs	25c	Bars	27c
Small "	26c		

Sheet Zinc.

Casks.....₩ ℔ 10½c | Sheet.....₩ ℔ 11c

Solder.

No. 1, Refined, in bars or plate.....16c
No. 2, " " " 15c
Pig Lead.....7½c
Sheet Copper—14 to 100 lbs. Sheets 8x20.....31c
10 to 12 lbs., " and 30x72.....32c
6 to 9 lbs., " 33c
Tinned, 14 and 16 oz. 14x48.....32c
Planished, 14 and 16 oz. 14x48.....39c
" No. 7, 8 and 9.....41c
Copper Bottoms.....44c

Sheet Iron

	Common.	Smooth Com.	Smooth Charcoal.	Smooth Juniata
No. 24	4¼c	5¼c	6¼c	8¼c
25 & 26	4½c	5½c	7 c	9 c
27	4¾c	5 c	7¼c	9½c

Galvanized Iron.....dis 25 %

No. 16 to 20	12c	No. 23	15c
21 to 24	13c	26	18
25 & 26	14c		

Russia Iron.—

Perfect	16c	No. 1 Stained	
		In Sheets, 1c higher.	
American Russia.—		B	11c
A	14c	In sheets, 1c higher.	
Lead.—		Lead Pipe, in full coils	8½c
Pig	7½c	Lead Pipe, when cut	8¾
Bar	8½c	Sheet Lead	9¼c

Wire—Bright.....dis 40 %
Coppered.....dis 30 %

CHICAGO.

(Reported by Frank Sturges & Co., 72, 74 & 76 Lake St.)

January 25, 1876.

Tin Plate.—

10x14, IC, Ch'l, Good A		14x20, IX, Ch' Best	$13 00
10x14, IC, " Best	9 50	14x20, IXX, "	15 50
10x14 IX, " "	12 00	14x20, IXXX, "	18 00
12x12, IC, " "	10 00	DC, 100 Plate, "	9 50
12x12, IX, " "	12 50	DX, "	12 00
14x20, IC, " "	10 50	DXX, "	14 50
14x20, IX, " "	13 00	DXXX, "	17 00
Rooning IC, Charcoal, Best			9 00
Rooning IX, Charcoal			11 50
20x28, IC, Charcoal Roofing, Com			18 00
20x28, IC, " " Good			18 50
20x28, IC, " " Best			19 00
20x28, IX, " "			23 50
10x14, IC, Coke Plates			8 50 to 8 75
14x20, IC, "			9 00 to 9 50
10x20, IC, "			14 00

Block Tin.—

Large Pigs	26c	Bars	28c
Small "	27c		

Zinc.—Sheet, 500 to 1000 lb. Casks

TO ALL WHO USE STEAM-POWER!

We will put our Governor on any Engine, and guarantee it to prove itself superior to all others.

If, after a fair trial, it does not, we will take it off at our own expense.

Shive Governor Co

BETHLEHEM, PA.

ALSO,

SHIVE'S PATENT WATCHMAN'S CLOCK AND DETECTOR,

AND

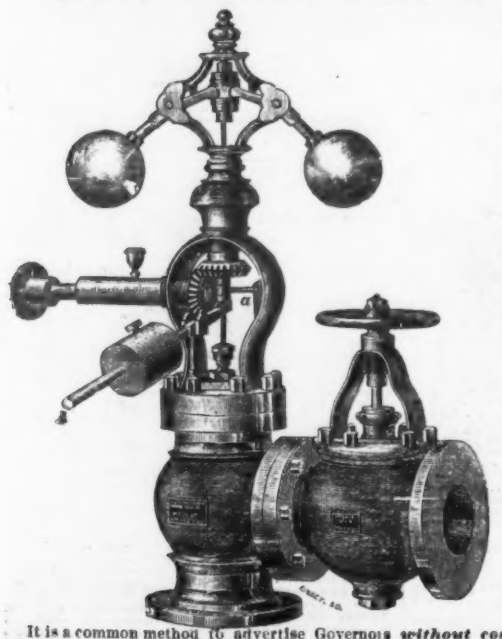
Buoy's Patent Counter Scale,

No Nest of Weights.

Circulars sent free

January 25, 1876. REDUCED PRICE LIST OF THE

JUDSON PATENT IMPROVED GOVERNORS.



☞ When Governors are ordered, be particular and say Governor with Stop Valve, or without Stop Valve; and either Plain or Bright Finish, as you may require, and with or without Lever Attachment.

For dimensions and other particulars send for Illustrated List.

Capacity of Valve or Diameter of Steam Pipe in inches.	PRICE.			
	Plain.	Bright Finish.	Lever Attachments for altering speed.	Improved Stop Valve.
¾	17·00	19·00	1·90	..
1	19·00	21·00	1·90	..
1¼	21·00	24·00	2·00	5·00
1½	25·00	28·00	2·25	6·00
1¾	29·00	33·00	2·50	8·00
2	35·00	40·00	2·75	10·00
2¼	42·00	48·00	3·25	14·00
2½	45 00	51·00	3·50	15·00
2¾	49·00	56·00	3·75	17·00
3	58·00	63·00	4·25	20 00
3½	64·00	73·00	4·50	25·00
4	74·00	84·00	5·00	30·00
4½	85·00	97·00	5·50	36·00
5	94·00	106·00	6·00	42·00
5½	112·00	125·00	6·50	48·00
6	125·00	138·00	7 00	54·00
7	150·00	165·00	8·00	68·00
8	185·00	202·00	9·00	80·00
9	205·00	225·00	10·00	..

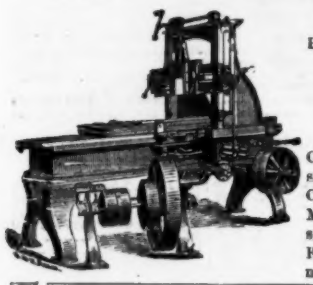
No Charge for Boxing & Cartage.

It is a common method to advertise Governors *without cost*, unless satisfactory to the customer, and then charge *High Prices* for doing what any good Governor will do. Various Governors inferior to the "Judson" are sold in this way, operating well enough for three months, to insure collection of the pay, but becoming useless after a year's wear—their construction lacking durability. The Judson Governor is guaranteed to be not only the best Regulator of Steam Engines, but also the most durable Governor made. Parties in buying other Governors should stipulate that their durability be guaranteed, and should also take care that they do not, for much inferior Governors, pay higher prices than those shown in the above list. We guarantee the Judson Governor will do all any other Governor can do, and in Accuracy and Durability—the main essentials—we guarantee it shall do more.

JUNIUS JUDSON & SON, Rochester, N. Y.

The Pratt & Whitney Co.,

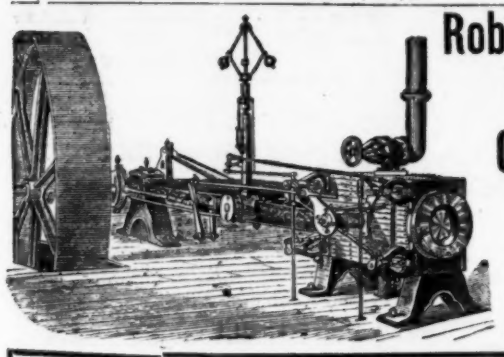
Hartford, Conn.,



Have constantly on hand and making

Drop Hammers

Of recently Improved Construction. Pony Trip Hammers, Blacksmiths' Sheaves, Broaching and Stamping Presses, Iron Shop Cranes, Machinists' Tools, Gun and Sewing Machine Machinery. Make to order Gray and Charcoal Iron Castings of all styles and sizes not exceeding 15 tons weight, (making patterns if desired). Furnish Clamp Pulleys of light patterns, cut gears in a superior manner, &c., &c.



Robt. Wetherill & Co

CHESTER, PA.

Corliss Engine BUILDERS

AND

Boiler Makers.

THORNE, DeHAVEN & CO.

21st Street, above Market, PHILADELPHIA.

DRILLING MACHINES.

PORTABLE DRILLS. Driven by power in any direction, self-feed and convenient adjustment.

RADIAL DRILLS. Self-feed—large adjustable box table—separate base plate, every convenience.

VERTICAL DRILLS. Self-feeding—of new and improved designs.

MULTIPLE DRILLS. For boiler work, etc., 2 to 20 spindles, fed and returned by power or hand, together or separately.

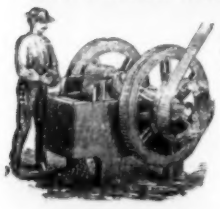
HORIZONTAL BORING AND DRILLING MACHINES. For large pieces—with boring head, adjustable, vertically and horizontally.

SPECIAL DRILLS. For special work. Gun Blank Drills, Coal Drills, &c., built to order.

BLAKE'S PATENT

STONE & ORE BREAKER.

New Pattern with Important Improvements & Abundant Strength



For reducing to fragments all kinds of hard and brittle substances, such as STONE for making the most perfect McADAM ROADS, and for making the best CONCRETE. It breaks stone at trifling cost for BALLASTING RAILROADS it is extensively in use in MINING operations, for crushing

IRON, COPPER, ZINC, SILVER, GOLD, and other ORES.

Also for crushing **Quartz, Flint, Emery, Corundum, Feldspar, Coal, Barytes, Manganese, Phosphate Rock, Plaster, Soapstone, &c.**

For Illustrated Circulars, and particulars, address,

BLAKE CRUSHER CO., New Haven, Conn.

BRADLEY'S CUSHIONED HAMMER

Has Larger Capacity,

Is More Durable, takes up Less Room, does More and Better Work with less expense for Power and Repairs than any other Hammer in use.

GUARANTEED as RECOMMENDED.

Address, BRADLEY MANUFACTURING CO., Syracuse, N. Y.

Knowles Patent Steam Pumps

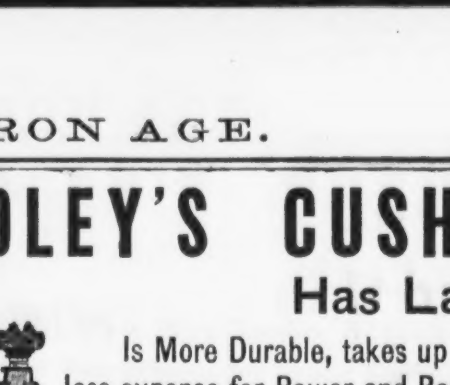
MANUFACTURED BY THE

KNOWLES STEAM PUMP WORKS,

WARREN, MASS.

WAREHOUSES:

14 & 16 Federal Street, Boston, 92 & 94 Liberty Street, N. Y.



Cut above represents regular Boiler Feed Pump, No. 3 and 4. Showing New Patent Valve Motion, and Hand Power LEVER Attached and Detached.

FIRE PUMPS, a specialty.

Mining Pumps (both Double Acting Plunger, and Piston Pattern,) which we guarantee to run absolutely noiseless on any lift from 100 to 600 ft., at a single lift, a specialty. Pumps for every possible duty. Prices as low as any, and our workmanship and material altogether the Best.

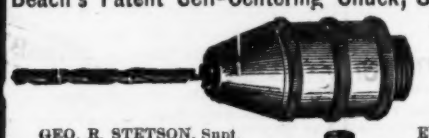
Every machine furnished under a complete guarantee.

Morse Twist Drill and Machine Company,

NEW BEDFORD, MASS., Sole Manufacturers of

Morse Patent Straight-Lip Increase Twist Drill,

Beach's Patent Self-Centering Chuck, Solid and Shell Reamers.



All Tools exact to Whitworth's Standard Gauge.

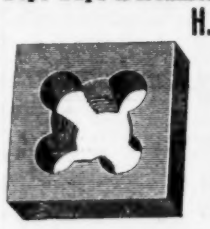
Drills made to fit any socket.

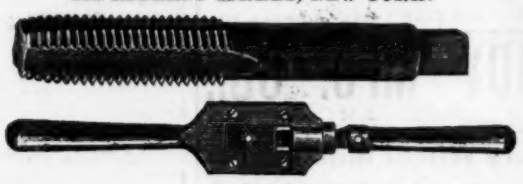
GEO. R. STETSON, Supt. EDWARD S. TABER, Treas.

For our manufactures of **V** and **Franklin Institute Standard Shape of Threads, Pat. Machine Relieved Nut, Hand Blacksmith and Machine Screw Taps and Dies, Screw Plates and Tap or Reamer Wrenches, Patent Relieved Pipe Taps & Reamers.**

H. S. MANNING & CO., are our General Agents.

111 LIBERTY STREET, NEW YORK.



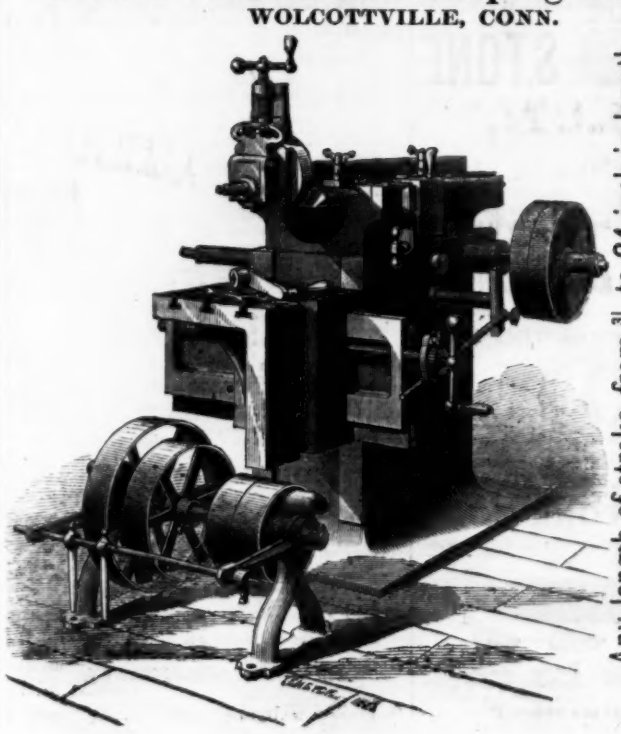


THE HENDEY MACHINE CO.

MANUFACTURERS OF

THE MANVILLE Patent Planers and Shaping Machines.

WOLCOTTVILLE, CONN.

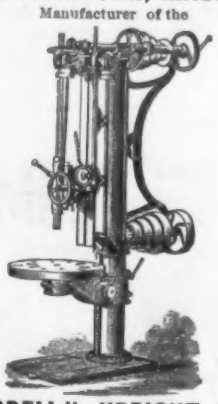


Any length of stroke from ¾ to 24 inch in length, while machine is running with perfect uniformity of speed of cutting tool. Automatic cross feed of 19 inch and 16 inch, from top of table to bottom of slide when table is down. Send for Circular and Price List.

P. BLAISDELL & CO.,

WORCESTER, MASS,

Manufacturer of the



"BLAISDELL" UPRIGHT DRILLS,

And other First-Class Machinists' Tools.

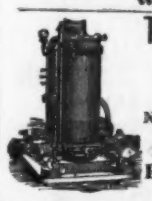
IMPROVED

Engine Lathes

SCREW MACHINES, &c.

JONES, LAMSON & CO.,

Windsor, Vt.



The Whitmore Engine.

SAFEST, CHEAPEST & BEST.

Lovegrove & Co.,

No. 121 South Fourth Street, PHILADELPHIA, PA.

Sole Manufactnrers

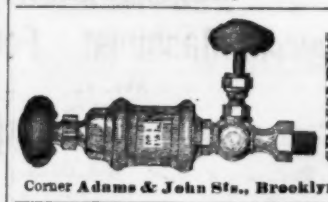
Engines, Boilers and Steam Pumps.

JOSEPH WALKER, Prop. H. B. LYONS, Manager.

NEW MACHINERY WAREROOMS

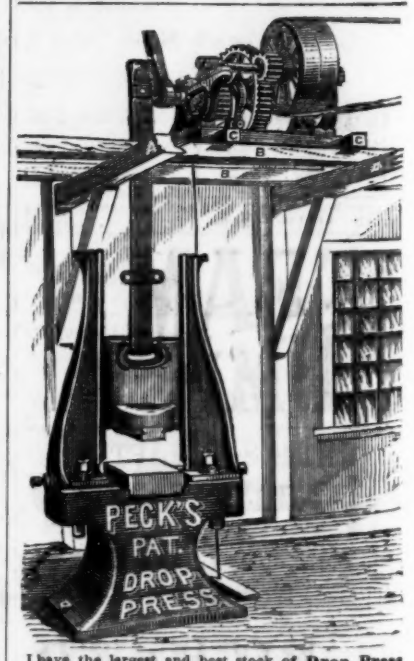
915 Market Street, Philadelphia.

Hampson, Whitehill & Co.'s Stationary, Portable and Hoisting Steam Engines; Shive Governors, a Sure Regulator; Machinists' Tools, (the Pratt & Whitney Co.'s,) of world-wide reputation; Knowles' and Pulsometer Steam Pumps; Jones' Scales, "The Test;" Union Emery Wheels, and General Machinery.



CROSSLEY'S Patent Lubricator, OVER 11,000 in Use.

Corner **Adams & John Sts., Brooklyn, N. Y.**



I have the largest and best stock of **Drop Press Patterns** in the country—suitable for Forging, and all kinds of Sheet Metal work.

WHY THE BEST:

It requires less power, works faster, gives a harder blow with same weight of hammer, the rebound of the hammer is caught without lessening the force of the blow, the blow is uniform and not affected by variations in the speed of the driver. It is always in order. **The Drop Press a specialty.**

MILO PECK, New Haven, Conn.

The Best Paper! Try It

The **Scientific American** is the cheapest and best illustrated weekly paper published. Every number contains from 10 to 15 original engravings of new machinery, novel inventions, Bridges, Engineering works, Architecture, improved Farm Implements, and every new discovery in Chemistry. The Scientific American has been published weekly for 30 years, and stands foremost of all industrial papers. A year's numbers contain 832 pages and several hundred engravings. Thousands of volumes are preserved for binding and reference. The practical receipts are well worth ten times the subscription price. Terms, $3·20 a year by mail, including postage. Specimens sent free. May be had of all News Dealers

PATENTS obtained on the best terms. Models of new inventions and sketches examined, and advice free. All patents are published in the Scientific American the week they issue. Send for Pamphlet, 110 pages, containing laws and full directions for obtaining Patents.

Address for the Paper or concerning Patents,

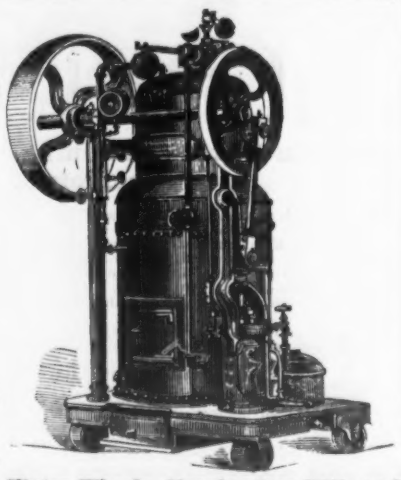
Munn & Co., 37 Park Row, New York

Branch Office, cor. F and 7th Sts., Washington, D. C.

Machinery, &c.

THE

Shapley Engine



Patented Feb. 10, 1874.

COMPACT,
PRACTICAL,
DURABLE,
ECONOMICAL.

$200·00.

Cheaper than any Engine offered of the same capacity.

MANUFACTURED BY

SHAPLEY & WELLS,
Binghamton Iron Works,
Binghamton, N. Y.

Manufacturers of **Steam Engines, Boilers, Water Wheels, Circular Saw Mills and Mill Work generally.**

Ludlow Valve Mfg. Co.,

OFFICE AND WORKS:

938 to 954 River St. & 67 to 83 Vail Ave., Troy, N. Y.,

VALVES

(Double and Single Gate, ¼ in. to 48 in.—outside and inside Screws, Indicator, &c.) for Gas, Water and Steam. Send for Circulars.

Also FIRE HYDRANTS.

Cor N 15 St. & Pennsylvania Ave., Phila.

E. HARRINGTON & SON,
Manufacturers of

ENGINE LATHES,

From twelve (12) to forty-eight (48) inches swing:

Hand Lathes; Wood Turning Lathes; Vertica Drills; Boring Mills; Tapping and Centering Machines; Screw Press for Mandrels Grindstone Boxes.

BUSH HILL IRON WORKS,

Corner 16th & Buttonwood Streets
PHILADELPHIA.

JAMES MOORE,

(Successor to MATTHEWS & MOORE,)

Engineer, Machinist, Founder and Boilermaker

CASTINGS of every description.

ROLLING MILL AND FURNACE EQUIPMENTS COMPLETF

Rolls Turned for Rails, Beams, Angles, and all shapes for Iron, Steel, or Composition Metals.

Sugar Mill, Saw Mill and Grist Mill Machinery,

AND MILLWRIGHTING IN GENERAL.

BOILERS—FLUE, TUBULAR AND CYLINDER, and all kinds of TANK AND PLATE IRON WORK.

WILSON MANUFACTURING COMPANY.,

NEW LONDON, CONN.

MANUFACTURERS OF

SOLID BOX VISES.

With or without Convex and Concave Washers.

Jackscrews, Braces, Coffee Mills, Turning Lathes; Clamp Heads and Screws; Parallel Bench Vises, Sash Pullies, Hot House Pullies, Composition Cocks, Bench Screws, Vise Screws, Gridirons, Drill Stocks and Bows, Box Chisels, Bisets, Sheaves, Block Pins, Composition Roller and Iron Bushings, Riggers' Screws, Caulkers' Tools, Pump Chambers, Belaying Pins, Marlin Spikes, Malleable Iron Castings, and General Hardware.

GALVANIZING DONE TO ORDER.

WILSON MFG. COMPANY,
Warehouse 97 Chambers and 81 Reade Streets. N. Y.

RICHARD DUDGEON,

No. 24 Columbia Street, New York,

MAKER AND PATENTEE OF

Hydraulic Jacks and Punches,

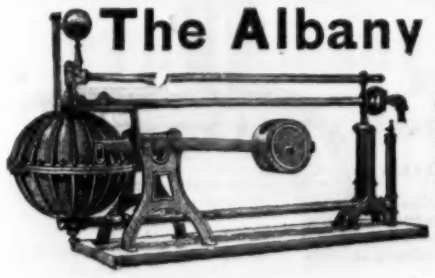
ROLLER TUBE EXPANDERS

And Direct-Acting Steam Hammers.

Communications by letter will receive prompt attention.

JACKS for Pressing on Car Wheels or CRANK PINS made to order

The Albany Steam Trap.



This Trap automatically drains the water of condensation from *Heating Coils*, and returns the same to the Boiler *whether* the Coils are *above or below* the water level in Boiler, thus doing awa with pumps and other mechanical devices for such purposes. Apply to

Albany Steam Trap Company,
Albany, N. Y.

Machinery, &c.

Established 1848.

WM. SELLERS & CO.,

1600 Hamilton Street, PHILADELPHIA.,

Engineers, Iron Founders and Machinists.

RAILWAY SHOP EQUIPMENTS.

Our Steam Hammers, Lathes, Planers, Drills and Bolt Cutters

Are of Improved and Patented Construction.

Railway Turning and Transfer Tables,

SHAFTING & MILL GEARING, a specialty.

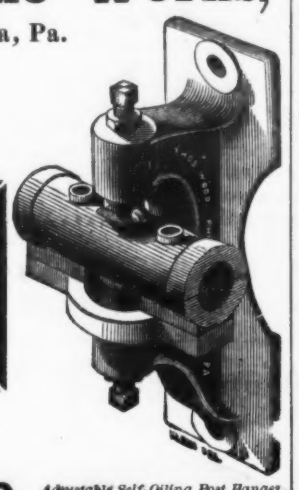
Pivot Bridges.

☞GIFFARD'S INJECTOR--IMPROVED, SELF-ADJUSTING.☜

Fairmount Machine Works,

Office, 2106 Wood St., Philadelphia, Pa.

POWER
Hoisting Machines,
WITH OR WITHOUT
Cage, as required.



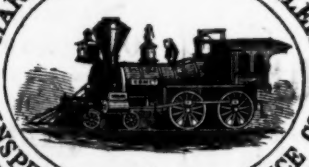
ADJUSTABLE SELF-OILING HANGER.

THOMAS WOOD, *Adjustable Self-Oiling Post Hanger 6 in. from post to center of shaft.*

MANUFACTURES AS SPECIALTIES,

POWER LOOMS, with (new) Patent Box Motion. SPOOLING, BEAMING, DYEING and SIZING MACHINES.
BOBBIN WINDING MACHINES—wind direct from hank or skein to shuttle bobbin.
SHAFTING, with Patent Adjustable Self-Oiling Bearings.
PLANS taken, and FACTORIES fitted out complete with Shafting and Gearing.
PULLEYS, from 4 inch to 10 feet diameter, of most Approved Pattern.
SELF-ACTING WOOL SCOURING MACHINES, (Yewdall's Patent.)
Machine and Foundry Work in all their branches. Send for Price List of Pulleys & Shafting.

HARTFORD STEAM BOILER INSPECTION AND INSURANCE CO.



Issues Policies of Insurance after a careful Inspection of the Boilers

COVERING ALL LOSS OR DAMAGE TO

Boilers, Buildings and Machinery,

ARISING FROM

STEAM BOILER EXPLOSIONS.

The Business of the Company includes all kinds of STEAM BOILERS

Full information concerning the plan of the Company's operations can be obtained at the

COMPANY'S OFFICE, HARTFORD, CONN.,

or at any Agency.

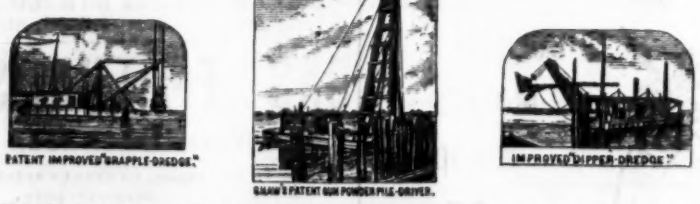
J. M. ALLEN Pres. W. B. FRANKLIN, Vice-Pres. J. B. PIERCE, Sec'y.

Board of Directors:

J. M. ALLEN, President.
LUCIUS J. HENDEE, Pres't Ætna Fire Ins. Co.
FRANK W. CHENEY, Ass't Treas. Cheney Brothers Silk Manufacturing Co.
CHARLES M. BEACH, of Beach & Co.
DANIEL PHILLIPS, of Adams Express Co.
GEO. M. BARTHOLOMEW, Pres't Amer. Nat'l Bank.
RICHARD W. H. JARVIS, Pres't Colt's Fire Arms Manufacturing Co.
THOMAS O. ENDERS, Sec Ætna Life Ins. Co.
LEVERETT BRAINARD, of Case, Lockwood & Brainard.
GEN. WM. B. FRANKLIN, Vice Pres't Colt's Pat. Fire Arms Mfg. Co
AUSTIN DUNHAM, Pres't Willimantic Linen Co.
GEO. CROMPTON, Crompton Loom Works, Worcester.
EARL P. MASON, Pres't Prov. & Wor. R. R., Prov.
WILLIAM ADAMSON, of Baeder, Adamson & Co., Philadelphia.
WM. B. BEMENT, of Wm. B. Bement & Co., Phila.
S. P. M. TASKER, of Morris, Tasker & Co., Philadelphia.
C. W. FREELAND, Treas. Dwight Manufacturing Co., Boston.

THEO. H. BABCOCK, Manager,
New York Branch. No. 1 Park Place.

THE AMERICAN DREDGING CO.



PATENT IMPROVED "GRAPPLE-DREDGE."

GAUM'S PATENT GUN POWDER PILE-DRIVER.

IMPROVED "DIPPER-DREDGE."

BUILDERS OF STEAM DREDGING MACHINES,

GUNPOWDER PILE-DRIVERS, &c.

CONTRACTORS FOR

IMPROVING RIVERS AND HARBORS,

EXCAVATING CANALS,

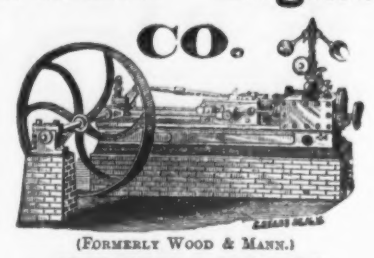
RECLAIMING AND FILLING LOW LANDS,

PILING FOR FOUNDATIONS, PIERS, Etc.

Offices, No. 10 South Delaware Ave., Phila'a.

Machinery, &c.

UTICA Steam Engine CO.



(FORMERLY WOOD & MANN.)

STATIONARY & PORTABLE

STEAM ENGINES.

The best and Most Complete Assortment the Market.

These Engines have always maintained the very highest standard of excellence. We make the manufacture of Engines, Boilers and Saw Mills a specialty. We have the largest and most complete works in the country with machinery specially adapted to the work.

We keep constantly in process large numbers of Engines, which we furnish at the very lowest prices and on the shortest notice. We build Engines specially adapted to Mines, Saw Mills, Grist Mills, Tanneries, Cotton Gins, Threshers and all classes of manufacturing.

We are now building the celebrated Lane Circular Saw Mill, the best and most complete saw mill ever invented.

We make the manufacture of Saw Mill Outfits a special feature of our business, and can furnish complete on the shortest notice.

Our aim in all cases is to furnish the best machinery in the market, and work absolutely unequalled for design, economy and strength.

Send for Circular and Price List.

UTICA STEAM ENGINE CO.,
UTICA, N. Y.

The WHITMORE PORTABLE ENGINE

Cheapest, Best, Most Economical **ENGINE and BOILER** Set in a Water Bottom.

Send for Circular with Testimonials.

A. C. TULLY & CO.,
57 Vey Street, N. Y.

AQUOMETER Steam Pump.

Highest Premium awarded by Franklin Institute, 1874,

For Simplicity, Economy of Construction & Efficiency.

An absolutely Durable, Cheap, Efficient and Economical Steam Pump. Requires no special care or lubricating. Warranted. Address for circular,

AQOMETER STEAM PUMP CO.,
10 South Dela. Avenue, Philadelphia.

LE COUNT'S

Pat. Machinists' Tools.

REDUCED PRICES.

Set Iron Dogs,	⅜ to 2 in.	$ 5·60
" " "	⅜ to 4 in.	12·00
" Steel "	⅜ to 2 in.	6·30
" " "	⅜ to 4 in.	13·00

Iron and Steel Clamps, Die Dogs, Clamp Dogs,

Vise Clamps, Expanding Mandrels, &c.

Send for latest Price Lists to

C. W. LE COUNT,
South Norwalk, Conn.

The Frazer Axle Grease and Lubricator.

A pure Lubricator, free from water, gum or sediment. The best article made for *Wagons, Open Journals, Cog Wheels Rollers* and wherever a *Solid Lubricator* or *Grease* can be applied. Put up in Boxes, Kegs and Barrels. For prices see New York Price List in this paper.

Established 10 years.

Frazer Lubricator Company,
104 Maiden Lane, New York.

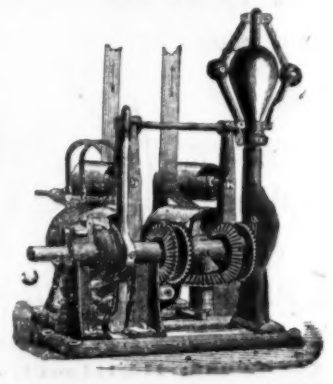
DIFFERENTIAL GOVERNOR.

The HARTFORD GOVERNOR CO.

Sole makers of the

Weaver Differential Governor.

FOR WATER.



"Powerful, positive, radically new. Introduced and working with complete success. Write us for circular, etc., at

HARTFORD, CONN.

TUBAL SMELTING WORKS,

760 South Broad Street, PHILADELPHIA.

PAUL S. REEVES,

MANUFACTURER OF

ANTI-FRICTION METALS.

XXX Genuine	40c	C	20c
XX	38c	D	15c
X	35c	E	13c
A	30c	F	11c
B	25c		

"Note."—The above are my standard mixtures, and have given satisfaction wherever used, but I am prepared to make Anti-Friction Metal of any quality or mixture desired by the purchaser.

BRASS CASTINGS, 21 to 35c. | INGOT BRASS, 19 to 28c. | BRASS TURNINGS AND OLD METALS WANTED.

ESTABLISHED 1842.

WM. & HARVEY ROWLAND,

PHILADELPHIA,

P. O. Address: Frankford, Philad'a. MANUFACTURERS OF ALL KINDS OF

Elliptic, Platform AND C Springs,

MADE EXCLUSIVELY FROM

SWEDISH STOCK, OIL-TEMPERED and WARRANTED.

Swedish Tire, Toe, Blister and Spring Steel.

CAST SPRING AND PLOW STEEL.
CAST SHOVEL, HOE AND MACHINERY STEEL.

OXFORD TOE, SLEIGH, TIRE AND SPRING STEEL.
BESSEMER SHOVEL AND PLOW STEEL.
BESSEMER MACHINERY AND CULTIVATOR STEEL.

RE-ROLLED NORWAY SHAPES.
NORWAY NAIL RODS ROLLED AND SLIT FROM SUPERIOR BRANDS.

Stearns' Pat. Expansion Hollow Auger, No. 2.

Having spent many years of careful research and in experimenting with a view of perfecting the Hollow Auger, we feel confident in offering this tool to the public that it is the long sought disideratum in Hollow Augers, and is destined to come into universal use. It is well made in every particular, and combines all sizes from ¾ to 1 inch. It has been thoroughly tested during the past three years, and we now place it on the market, believing it to be the most perfect Hollow Auger yet produced.
Send for catalogue and discount sheet to

GEO. N. STEARNS & CO., Syracuse, N. Y.

JARECKI'S ADJUSTABLE PIPE TONGS.

	Gas Burner to	
No. 0,	⅜	$3·00
No. 1,	½	3·50
No. 2,	¾	to 1 4·00
No. 3,	⅞	to 2⅛ 5·00
No. 4,	1¼	to 3⅛ 9·00
No. 5,	2⅛	to 6 16·00

Liberal Discount to the Trade.

It takes but a second to adjust them to any sized pipe within their range. The Steel Jaw is reversible, so that either end may be used. One end having fine teeth, which adapts it for grasping **Brass Pipe, Bolts and Studs,** which are not crushed by its use. A very useful tool about an **Engine, Lathe, Factory or Machine Shop.**

JARECKI MANUFACTURING CO Erie Pa.

R. E. NEIL, President. B. A. LANMAN, Treas. & Manager. F. G. WADDEL, Secretary.

COLUMBUS BOLT WORKS,

COLUMBUS, OHIO,

Manufacturers of BEST NORWAY IRON

Carriage, Steeple, Cone, Shackle, Elliptic, Shaft and Tire

All the different styles used by the manufacturers of the finest Carriages. Every Bolt warranted true to size and fit. Illustrated Price Lists mailed on application. Our facilities are unsurpassed for the manufacture of **Machine Bolts and Coach Screws.** Correspondence from Car, Bridge and Machinery Builders solicited

---

IRON MERCHANTS AND MANUFACTURERS.

Steam, Gas AND Water Work **Supplies.**

BOILER MAKERS' **Supplies.**

INCORPORATED 1875 — THE REDFIELD, BOWEN & WALWORTH COMPANY. — CHICAGO.

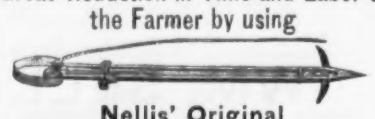
Cornice Makers' Supplies.

MALLEABLE, GRAY Iron & Brass CASTINGS To Order.

SALESROOMS: 112, 114 and 116 LAKE STREET.
WORKS: MICHIGAN, KINZIE and ST. CLAIR STREETS,
CHICAGO.

NEW TIME TABLE.

Great Reduction in Time and Labor to the Farmer by using



Nellis' Original

HARPOON HORSE HAY FORK,

Nellis' Grapple.

Grapple and Pulleys; also, Nellis' Patent Stacker and Method of conveying Hay, Straw, &c. A ton of Hay can be delivered in three to five minutes to any part of Mow or Stack. The right of Stacker and Conveyer granted FREE to the Farmer purchasing our Horse Hay Fork and Fixtures during season of 1875. With it Pulleys can be attached or detached to rafter or beam, without the use of a ladder.

NELLIS' PULLEY,

Improved Wrought Frame, Prepared Wood Wheel. Warranted superior to any Horse Fork Pulley offered in the market.

A trial of these goods will convince any farmer that he cannot afford to dispense with them, as their entire cost is often times saved by a single day's use.

Also manufacturers of all descriptions

Of Agr'cultural Steel & Iron,

Steel Tempered by Nellis' process to suit every kind of soil.

Prices and descriptive Catalogues of our goods furnished free. Address,

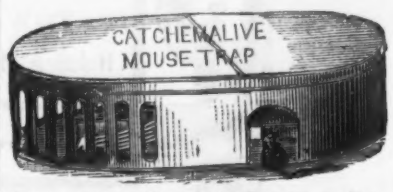
A. J. NELLIS & CO., Pittsburgh, Pa.
SEMPLE, BIRGE & CO., St. Louis, Mo., General Agents for the Southwest.

ESTABLISHED 1840.

R. E. DIETZ,

No. 54 & 56 Fulton, and 29 & 31 Cliff Street, New York,

Manufacturer of the



Each mouse caught resets the Trap for another.

TUBULAR

And Other

Patent Lanterns

BRASS AND IRON

Jack Chains.

STANLEY G. FLAGG & CO.

PHILADELPHIA, PA.

Office and Warehouse,
No. 216 & 218 N. THIRD ST.

Manufacturers of

STEEL CASTINGS.

A Substitute for Steel and Wrought Forgings.
Circulars sent on application.

UNIFORM SPEED

WARRANTED THE MOST PERFECT GOVERNOR IN THE WORLD

However great or violent may be the change of load We will warrant any positive uniform speed of Engine desired.

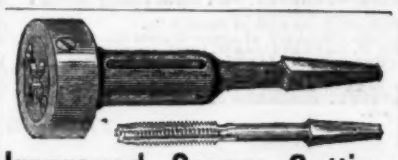
ADDRESS. HUNTOON GOVERNOR Co. LAWRENCE MASS.

EXCELSIOR Printing Presses

"Lowest Priced one BEST."

Do Your Own Printing!

$3 Press for cards, labels, envelopes, etc. Larger sizes for larger work. **Business Men** do their printing and advertising, save money and increase trade. Pleasure and profit in **Amateur Printing.** The Girls or Boys have great fun and make money fast at printing. Send two stamps for full catalogue of presses, type, etc., to the Manufacturers,
KELSEY & CO., Meriden, Conn.



Improved Screw Cutting Die and Holder.

This tool is particularly intended for [illegible]ding stove rods rapidly and accurately, and [illegible]useful also to carriage makers and in jo[illegible]n rods three-eighths and under.

WILEY & RUSSELL [illegible]CO., Greenfield, Mass.

GAS FIXTURES.

Lamps, Bronzes,

Equal to any made, in great variety, all of our own manufacture.

BRADLEY & HUBBARD MFG. CO.,
SALESROOMS:
21 & 23 Barclay, cor. Church St.,
NEW YORK.

SCRANTON **Brass Works,**

J. M. EVERHART,

Manufacturer of Brass Work for Water, Gas and Steam. Brass Castings and Jobbing promptly attended
SCRANTON, PA.

DIXON'S PURE PLUMBAGO FOR LUBRICATING.

Put up in Boxes containing 5, 10, 25 and 50 lbs. and in barrels of 200 lbs.

This article is prepared with great care, has more body than that prepared by any other party, and is as near perfect as possible.

We were the first manufacturers to put up Plumbago as a Lubricator: and the experience of years has shown that it will save more than half the expense of oil or grease, will absolutely cool off a hot journal, and save nearly all the wear, the axles or shafts being glazed over with it, and running almost without wear. A car axle will run four or five times as long if our Lubricating Plumbago is used freely. A second-class article, however, is worse than none, because it contains a grit that will wear both the shaft and the box.

If Engineers, Experts and Purchasing Agents knew how much wear and power would be saved by its use no shaft or axle would revolve without it; every shop and car would have it at hand.

The Journal of the Franklin Institute says:

"Every one knows that for heavy machinery plumbago is a good lubricant, but every one does not always think of applying it where it would serve best. It may be of value to some of our readers to know that a planer whose bed-plate required the force of eight men to slide it when lubricated with the best ordinary material, was easily shifted with one hand when plumbago of good quality was applied."

It is pure, very finely pulverized, is free from grit, and is prepared by the most expert manufacturers of **PLUMBAGO GOODS** in the world. Send for envelope sample.

THE JOS. DIXON CRUCIBLE CO.,

ORESTES CLEVELAND, President,

237, 239, 241 and 243 Railroad Ave., 250, 252, 254 and 256 Wayne Street, JERSEY CITY, N. J.

Russell, Burdsall & Ward,

PORT CHESTER, N. Y.

Manufacturers of

Carriage, Tire, Plow, Stove AND OTHER BOLTS.

Carriage Bolts made from Best Square Iron, a Specialty.

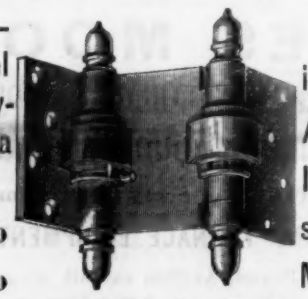
UNION SPRING HINGES.

DOUBLE OR SINGLE ACTING.

Especially adapted for Mosquito, Fly and Screen Doors.

Size 2½x2½, Japanned, with Nickel Plated Springs—giving a neat finish to a door.

Single Acting, Per Pair - - $1·00
Double Acting, Per Pair - - $2·00



To dealers ordering 4 pairs Double Acting, of this size, I will give a handsome Black Walnut Model.

The DOUBLE ACTING UNION SPRING HINGE is the best and cheapest appliance known for swinging a light door both ways.

WAREROOMS, 79 Chambers St., N. Y.

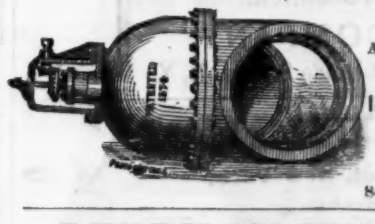
M. W. ROBINSON, Sole Agent.

Armstrong & Hutchinson,

Manufacturers of

PATENT STOP GATES

For Water, Gas and Steam,



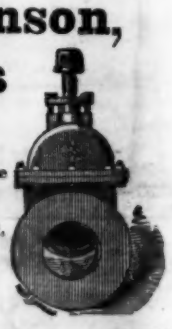
From 2 in. to 50 in. diameter.

Also, **Fire Hydrants, Single and Double Nozzle.**

Improved Boiler Feeders, Etc.

Cor. Park Way & Sandusky Sts., ALLEGHENY, PA.

Send for Circular.



DERBY SILVER CO., Derby, Conn.,

Manufacture the most reliable

SILVER PLATED SPOONS & FORKS.

They are plated by weight, and not by time or guess, containing 20 per cent. more silver than the usual standard, on a base of Nickel Silver, and finished by hand. Each article is guaranteed by the trade mark and warranted to give full satisfaction. We ask of the trade a fair and impartial test, assuring them that the high standard already attained, shall be maintained. Send for Catalogue and Price.

Pat. Open Way

Schofield's Pat. Gauge Cock.

HENRY C. MEYER & CO.,

Manufacturers of

BRASS WORK

For Water, Gas and Steam.

Importers and Dealers in PLUMBERS' MATERIALS,
46 & 48 Cliff Street, N. Y.

Specialties manufactured and controlled by us: Fuller's Patent Faucets and Mineral Water Cocks; Murdock Hydrants and Street Washers; Flower's Open Way Valves; Schofield's Gauge Cocks; Hall's Lock Gas Cocks. Illustrated Catalogues expressed to the trade on application, where this advertisement is referred to.

The Most Durable for Hot or Cold Water ever made.